



Models QT-740 and QT-750

Fixed/Elevating Float-Top Radiographic Tables

Service Manual



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B	1/5/01	Added long. magnet adjustment, tabletop width adjustment, DC Motor Driver Bd. replacement procedure

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Revision History

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Chapter

1

SPECIFICATIONS



PHYSICAL SPECIFICATIONS

The following are physical specifications of the radiographic tables:

TABLETOP SPECIFICATIONS

Length:	85.0 inches (2159.0 mm)
Width:	35.5 inches (901.7 mm)
Height (Model QT-740):	32.5 inches (825.5 mm)
Height (Model QT-750):	
Raised:	32.5 inches (825.5 mm)
Lowered:	21.0 inches (533.4 mm)
Tabletop Travel:	
Longitudinal:	32 inches (812.8 mm)
Lateral:	10 inches (254 mm)
Tabletop Motion:	4-Way Floating
Tabletop Material:	Fiber-resin (phenolic)
Tabletop X-ray Density:	<1.0 mm Aluminum
Tabletop-to-Film Plane Distance:	approx. 2.5 inches (63.5 mm)

TABLE BASE SPECIFICATIONS

Width:	48.0 inches (1219.2 mm)
Depth:	26.0 inches (660.4 mm)
Weight Capacity (Max. Patient Load):	650 lbs. (295 kg)

IMAGE RECEPTOR SPECIFICATIONS

Compatible With:	Grid Cabinet, Bucky, ACL Bucky
Receptor Longitudinal Travel:	20.0 inches (508.0 mm)

SYSTEM SPECIFICATIONS

Tube Stand Compatibility:	Compatible with all Quantum Medical Imaging tube stands and overhead tube cranes
Overall Weight:	
Model QT-740:	350.0 lbs. (158.8 kg)
Model QT-750:	500.0 lbs. (226.8 kg)

Chapter 1 Specifications

ELECTRICAL SPECIFICATIONS

Input Power:	115 VAC ($\pm 10\%$), 15 Amps, 50/60 Hz 230 VAC ($\pm 10\%$), 10 Amps, 50/60 Hz
Mode of Operation:	
Model QT-740:	Continuous
Model QT-750:	Intermittent Operation (80 cycles/hour max.)
Momentary Current:	
Model QT-740:	2.0 Amps
Model QT-750:	5.0 Amps
Long Term Current:	
Model QT-740:	0.05 Amps
Model QT-750:	0.20 Amps
Locking System Power:	24 VDC/4.35 Amp

SYSTEM OPTIONS

- Abdominal compression band
- Lateral cassette holder (for cross-table work)

SYSTEM OPERATING ENVIRONMENT

Ambient Temperature:	+10°C to +40°C
Relative Humidity:	20 to 80%, non-condensing
Altitude:	-30.5 to +2440 meters relative to sea level

NON-OPERATING ENVIRONMENT

Ambient Temperature:	-18°C to +70°C
Relative Humidity:	20 to 95%, non-condensing
Altitude:	-30.5 to +3048 meters relative to sea level

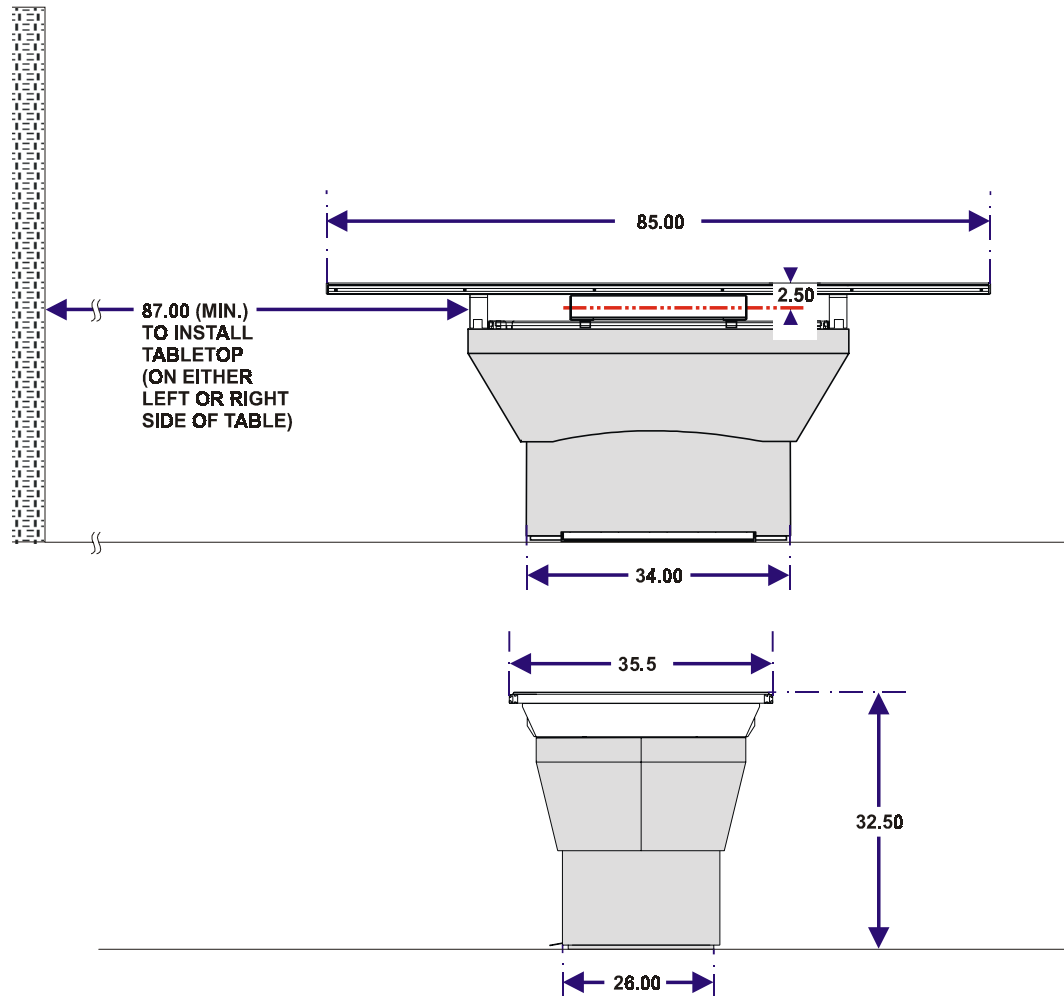


Figure 1. Model QT-740 Table Configuration Diagram

Chapter 1 Specifications

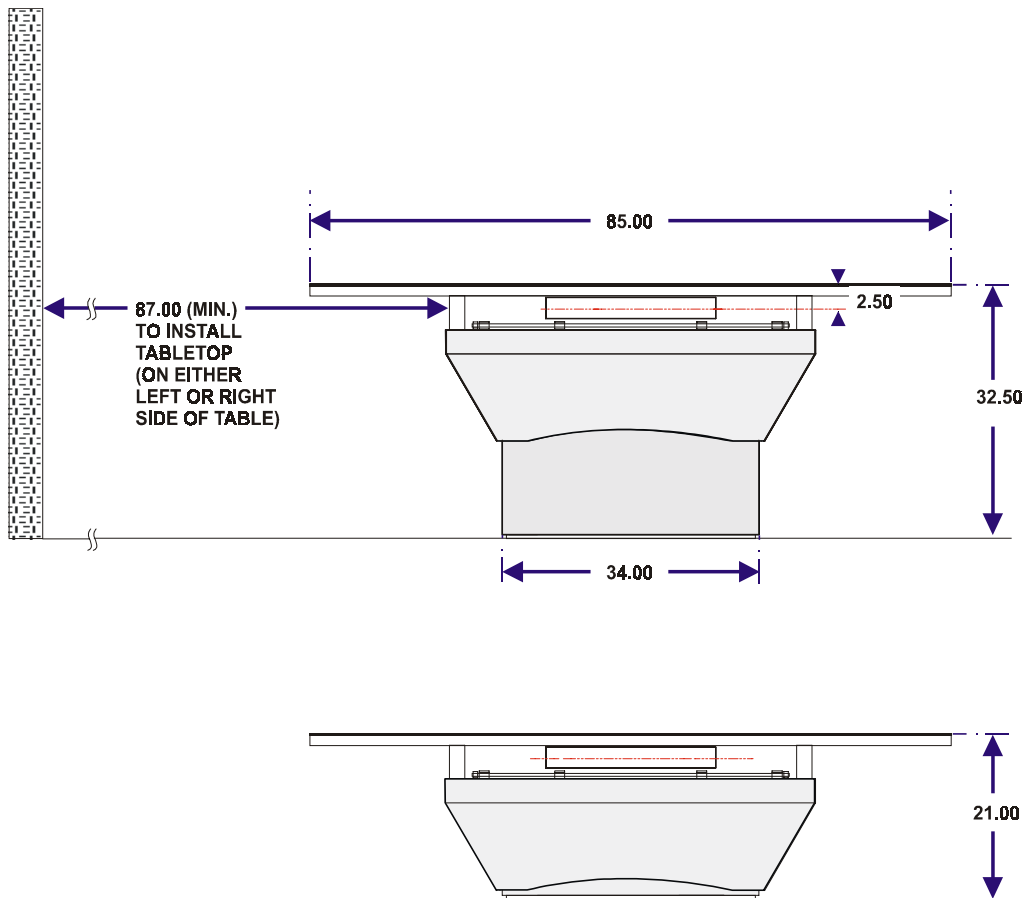


Figure 2. Model QT-750 Table Configuration Diagram

Chapter

2

ASSEMBLY & INSTALLATION



OVERVIEW

Preparing the table for operation requires completion of the following tasks:

- Positioning the Table Base
- Making the Electrical Connections
- Alignment Procedures
- Tabletop Assembly/Installation
- Checking Table Operation
- Installing the Covers

UNPACKING

Open crate or carton marked "packing list enclosed" first. Remove packing list and use it as a guide to open the remaining cartons. Do not dispose of packing material until packing list is matched with actual parts received. Should there be a shortage or damage, notify Quantum Medical Imaging, LLC's customer service department immediately. The manufacturer is relieved of any responsibility for damage during shipment after unit is picked up by the carrier.

TABLE ASSEMBLY

The radiographic table is shipped with most of its major components assembled. However, the tabletop assembly must be attached to the base assembly. After the table is assembled, an operational check is performed. (This check is required only on Model QT-750 Odyssey HF Series X-ray Generators.)

POSITIONING THE TABLE BASE

Place the table base in the approximate location where it will be mounted. Ensure that the floor below the table is level. When positioning the table base, ensure there is a minimum clearance of 87 inches from the outer edge of Bearing Rail to the wall on either side of the table (see Figures 1 and 2). This allows for installation of the tabletop rails following table mounting. If enough clearance is provided, proceed to the "Electrical Connections" paragraph in this chapter.

If there is not enough clearance on either side to install the tabletop after the table is mounted to the floor, the tabletop must be installed prior to mounting the table. To install the tabletop, proceed to the paragraph entitled "Tabletop Assembly/Installation" before performing the next procedure.

NOTE

Examine all cartons and crates carefully at time of delivery. If damage is apparent, have delivery driver write a "Damaged Shipment Note" on copies of freight bill, sign it, and file appropriate carrier claim. Should you discover concealed damage, immediately notify the transporting agent and ask for an "Inspection of Damage". Carrier will not accept concealed damage claim if filed after 15 days from date of receipt of merchandise.

Chapter 2 Assembly & Installation

ELECTRICAL CONNECTIONS



CAUTION! This equipment contains electrostatic sensitive devices. Observe proper grounding precautions before handling components or printed circuit boards.

The table can be powered from independently fused power source (mains) or from specified equipment, such as an X-ray generator. The power supply line input connection is fused internal to the table (2A for 115 VAC line input, 1A for 230 VAC line input for Model QT-740 tables; 6A for 115 VAC line input, 3A for 230 VAC line input for Model QT-750 tables).

For 115 VAC installations, a 25-foot power cord with a hospital-grade plug is factory pre-wired to the table. Based on installation requirements, the plug can be removed, such as when the table is permanently wired to mains or an X-ray generator. For 230 VAC installations, a 25-foot "HAR" power cord is factory pre-wired to the table. All electrical connections must be made in compliance with NEC requirements. The table is completely factory pre-wired; no connections are required to enable the internal circuitry.

Power Input Connections (Permanent Wiring Configuration)

1. To connect external wires to table, either bring cables through the rear bottom cover access opening or, if conduit and flush floor box is run beneath the table, through the large 6" x 5" opening in the table base.
2. Route power input to Terminal Block terminals TB1-1, TB1-2 and TB1-3 (located on table base) as shown in Figure 3. If line cord with plug is provided by the facility, a 16 AWG minimum cord (Type SJT or equivalent) and hospital grade plug must be used. Connect plug to hospital grade receptacle only.
3. Connect system ground wires as shown in Figure 4.

Bucky Power Input Connections

To connect bucky wiring to table, route bucky cable through rear bottom cover access opening to Terminal Block TB2 (see Figure 3). Refer to QT-740 and QT-750 Table Wiring Diagrams in Chapter 5, Diagrams and to bucky manufacturer's installation manual (provided with system) for specific bucky wiring information.

PBL Interlock Cable Connections

On Model QT-750 tables using PBL interlock, connect PBL cable in accordance with QT-740 and QT-750 Table Wiring Diagrams (refer to Chapter 5, Diagrams).

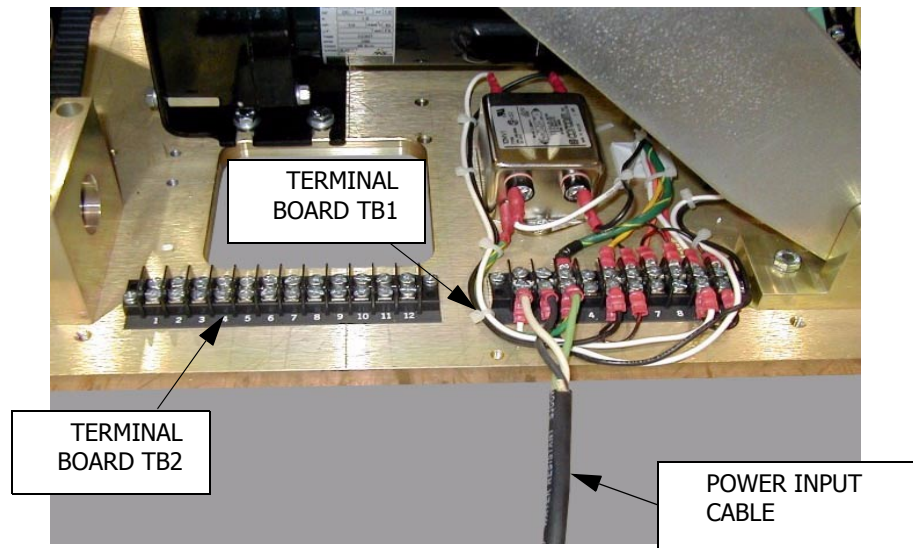
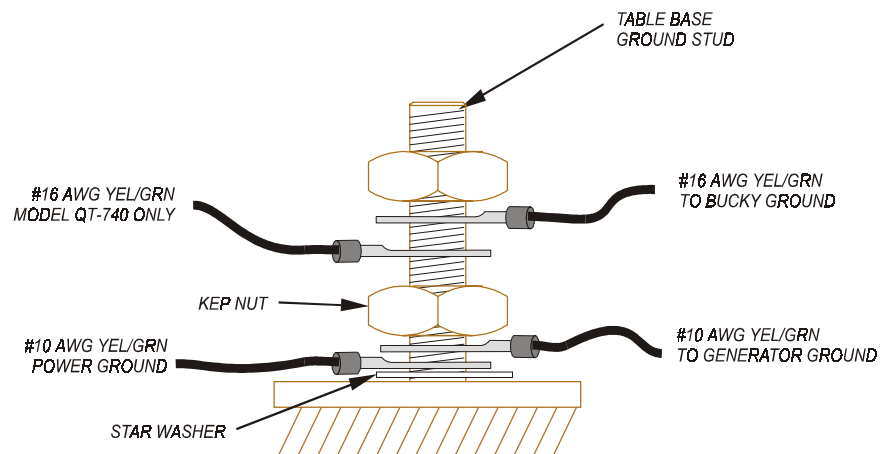


Figure 3. Connecting Input Power Cable



NOTE:
PHYSICAL EARTH GROUND (YEL/GRN
AWG 10) FROM GENERATOR AND TABLE MUST
BE PERMANENTLY CONNECTED TO TABLE
GROUND STUD AND SEPARATE FROM OTHER
GROUND WIRES (BELOW LOWER NUT) AS SHOWN
IN THIS FIGURE AT TIME OF INSTALLATION.

Figure 4. System Ground Wire Connections

Chapter 2 Assembly & Installation

ALIGNMENT PROCEDURES

TABLE LEVELING

Before aligning the table to the collimator light field, the table must be leveled. This is achieved by adding flat shim plates under the 1/2" aluminum base plate. The shims, which measure approximately 3" x 5", are included with the table hardware kit.

1. Move the entire table under the collimator, positioning the tray center as close to the cross-center spot as possible.
2. Place a level on the table or bucky. A double-bubble level at least 18" long is recommended.
3. If the table is not perfectly level, place the flat shim plates near the mounting locations as required until the table or bucky reads level.

IMAGE RECEPTOR/COLLIMATOR X-RAY ALIGNMENT

The image receptor must be properly aligned with the projected light field of the collimator in order to provide accurate x-ray exposures. If the tubestand used with the table provides transverse travel of the x-ray tube relative to the table, set the tube transverse travel in the center detent position prior to performing alignment.

The following x-ray alignment procedure may require slight repositioning of the table base. This movement may affect the position or arrangement of the leveling plates, requiring an additional check prior to final table mounting.

Collimator calibration, tubestand alignments, and collimator light field to x-ray field adjustments, as described in their respective manuals, must be performed prior to the following procedure.

1. If the tabletop is installed, remove the radiographic portion of the tabletop, otherwise, proceed to step 2. The tabletop is held on with dual-lock tape; lift up a corner then carefully pull the tabletop off.
2. With the collimator parallel to the tabletop (0°), turn on the collimator light. Using the light field adjusting knobs on the collimator, reduce the light field to a narrow beam of light along the length of the table.
3. Position the collimator to approximately 24" source-to-image distance (SID).
4. Insert a 14" x 17" cassette into the film tray.
5. Turn on power to the table.

6. Turn on the collimator light and move the entire table so that the longitudinal center line on the cassette (i.e., the line which is parallel to the length of the table) is properly aligned with the narrow beam of light (see Figure 5).

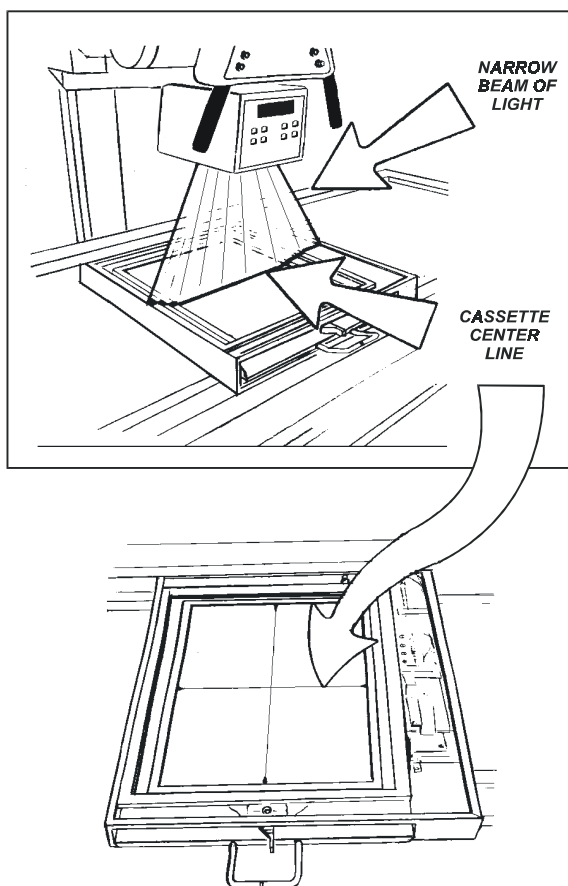


Figure 5. Table Longitudinal Axis Alignment

7. Remove cable tie securing the Receptor Cabinet to tabletop frame.
8. Move the tubestand and Receptor Cabinet simultaneously to check for continuous alignment of the narrow beam of light to the cassette center line (see Figure 5).
9. If the light beam and cassette center line are in proper alignment, mount the table through the 3/8" diameter holes in the front and back (be sure the leveling shim plates are in the proper position). Use hardware suitable for the type of floor in the installation and of sufficient strength to handle 500 lb. pull-load.

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10. Position the collimator at 40" SID.
11. Pull the cassette film tray handle out so it extends out of the front opening in table.
12. Turn on the collimator light.
13. Check for proper alignment of the image receptor centering light (emitted by the collimator) with the notch in the cassette film tray handle. If misaligned, refer to the collimator manual for alignment procedures.

TABLETOP ASSEMBLY/INSTALLATION



CAUTION! Be careful not to damage the Obstruction Sensors when installing the Tabletop Assembly.

The following procedure describes how to install the Tabletop Assembly in the Tabletop Frame.

1. Unpack the Tabletop Assembly from the carton.
2. At one end of the Tabletop Assembly, remove three (3) 1/4-20 x 1" low profile socket head screws securing End Trim Plate to Tabletop Assembly.
3. Remove two (2) Table Top End Stop Bumpers from Tabletop Frame (see Figure 6).

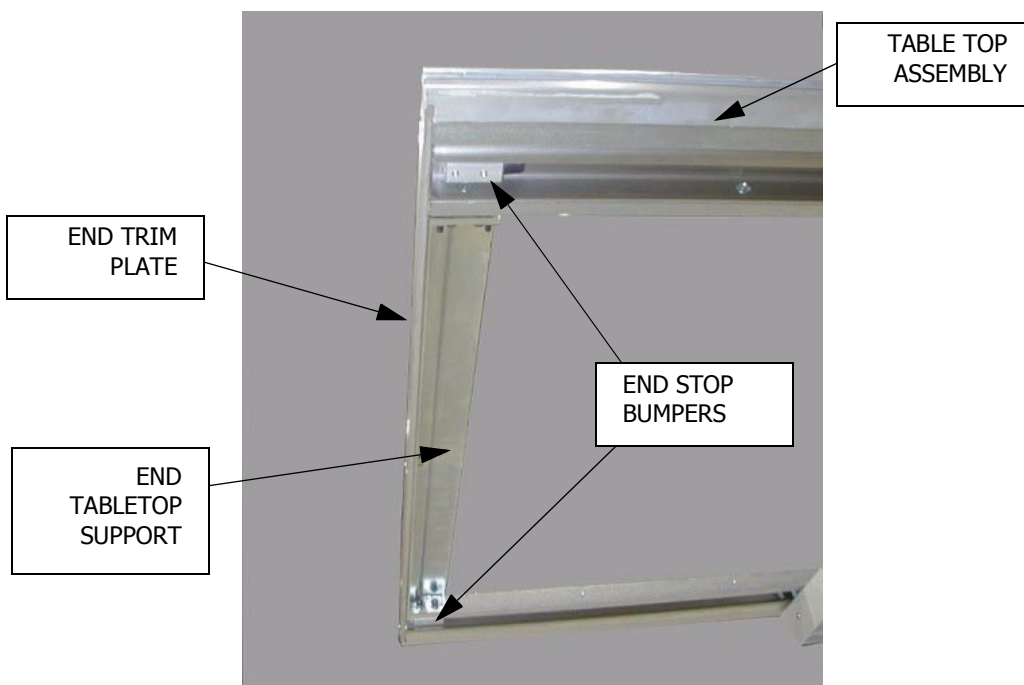


Figure 6. Table Top End Trim Plate and End Stop Bumpers

Chapter 2 Assembly & Installation

4. Apply power to the table. While pressing the FLOAT foot pedal (or FLOAT push button switch), push in the two float top longitudinal electromagnets so locks are in "released" position (see Figure 8). This will provide sufficient clearance to slide the table top past the magnets, and will avoid magnet bracket adjustment required if the magnet brackets are loosened for table top installation. If table top cannot be installed in this way, the two (2) hex head bolts securing each Longitudinal Magnet Bracket must be loosened to permit tabletop installation.
5. Slide the Table to Assembly onto the bearing assemblies from the right-hand end of the table (as viewed from front of table).
6. Verify tabletop frame is square as follows:
 - a. At one end of the table, measure the distance between the inside edges of tabletop rails as shown in Figure 7. The distance should be $27'' \pm 1/16''$. If not, loosen two (2) socket head cap screws securing End Tabletop Support to Tabletop Rail (see Figure 7). Adjust set screws until required distance is attained, then re-tighten socket head cap screws.
 - b. Repeat the above measurement at the opposite end of the table and, if necessary, adjust width of tabletop as in previous step. However, ensure the difference between the two widths (i.e., step 10a width minus step 10b width) does not exceed $1/32''$ as this may adversely affect tabletop motion.

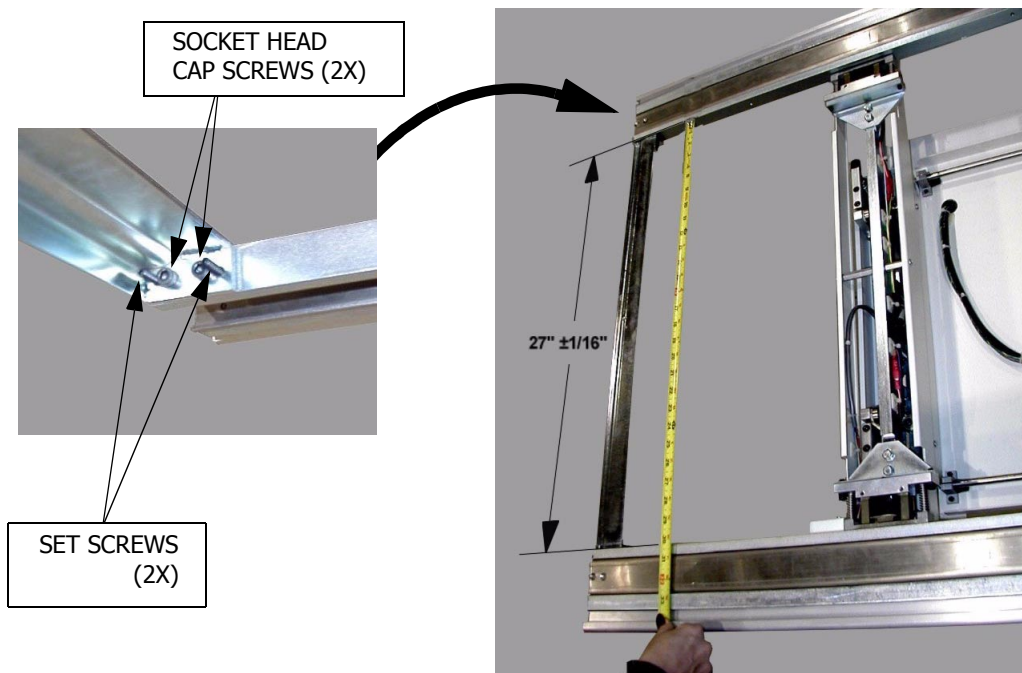


Figure 7. Adjusting the Tabletop Width

Chapter 2 Assembly & Installation

7. If magnet brackets were loosened for tabletop installation, re-align longitudinal magnets as follows:
 - a. Place a 0.03" feeler gauge (approximate thickness of two business cards) between magnet and Brake Pad and re-tighten screws as shown in Figure 8).

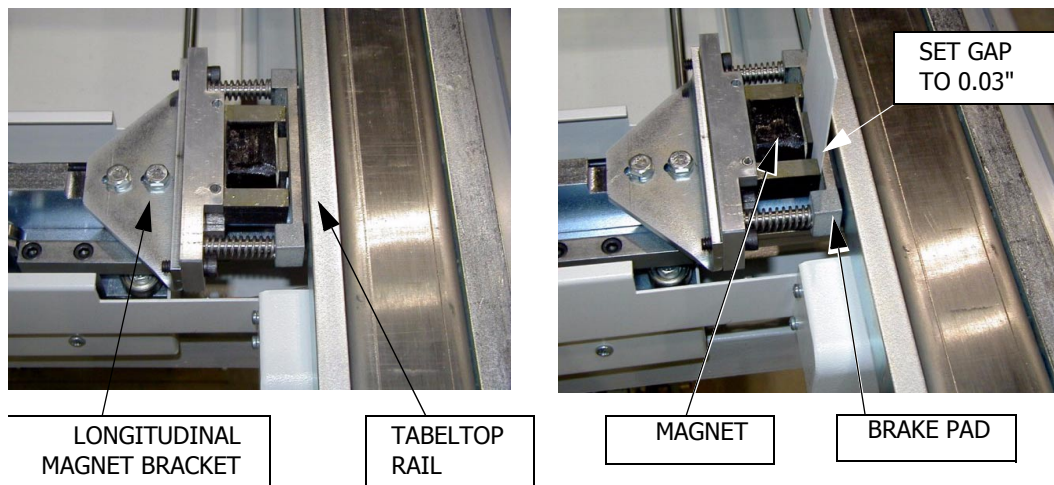


Figure 8. Adjusting the Longitudinal (Float) Magnets

- b. Press float foot pedal. The magnet should release from Brake Pad. If not, push against magnet until it releases.
 - c. Slide the Longitudinal Magnet Bracket toward Tabletop Rail until Brake Pad just contacts the rail. Ensure Brake Pad is parallel with respect to rail.
 - d. Tighten two (2) hex head screws in Longitudinal Magnet Bracket.
8. Reattach the End Trim Plate to the Tabletop Assembly.
9. Re-install the two (2) Table Top End Stop Bumpers on Tabletop Frame.
10. Install strip of double-sided tape (supplied with system) on End Tabletop Support (see opposite End Tabletop Support with factory-installed tape for correct positioning).
11. Install the radiographic portion of tabletop (i.e., phenolic) by carefully placing it on the Tabletop Assembly.
12. Press down firmly along all four edges of the phenolic tabletop to secure.

OPERATIONAL CHECKS AND ADJUSTMENTS

When the table is completely assembled and all required electrical connections have been made, perform the following tests to verify proper system operation. Tests for the table's elevating (up/down) functions and positive beam limitation (PBL) are required only on Model QT-750 Odyssey HF Series X-ray Generators.

CHECKING TABLE FLOAT-TOP OPERATION

1. Depress the FLOAT foot pedal. The tabletop should move freely in either direction. Release the FLOAT foot pedal. The tabletop should be locked securely in its present position.
2. Depress the FLOAT push button. The tabletop should move freely in either direction. Release the FLOAT push button. The tabletop should be locked securely in its present position.

CHECKING UP/DOWN OPERATION (MODEL QT-750 ONLY)

Depress the UP and then the DOWN foot pedal. The following should occur while each foot pedal is depressed:

1. The tabletop should start to move up (while the UP foot pedal is pressed) and down (while the DOWN foot pedal is pressed).
2. The FLOAT foot pedal (the outside pedals) should be disabled (i.e., the tabletop should remain locked) while the tabletop is moving up or down.
3. With the table running either up or down, press the red Emergency Stop Switch. Table up or down motion should stop. Turn the Emergency Stop Switch counterclockwise until it is released. Tabletop up/down motion is now enabled when foot pedals are pressed.
4. While running the table down, manually activate each Down Limit Safety Switch (S7 and S10, see Figure 9). The table should stop driving down.
5. While running the table up, manually activate each Up Limit Safety Switch (S8 and S9, see Figure 9). The table should stop driving up.



CAUTION! Table up/down height must be set to the heights specified in the following steps. Failure to do so can cause damage to table components.

6. With table top in fully up position, measure table top height (i.e., distance from floor to top of table). Table up height should be 32" (812.8 mm). If not, loosen two (2) screws on Up Limit Safety Switch Mounting Bracket and adjust position of the Up Limit Safety Switches. Verify correct table top height after adjustment.
7. With table top in fully down position, measure table top height (i.e., distance from floor to top of table). Table down height should be 21.5" (546.1 mm). If not, loosen two (2) screws on Down Limit Safety Switch Mounting Bracket and adjust position of the Down Limit Safety Switches. Verify correct table top height after adjustment.

Chapter 2 Assembly & Installation

TABLE UP/DOWN SPEED ADJUSTMENT (MODEL QT-750 ONLY)

If an adjustment to the Up/Down motor speed is necessary, it can be accomplished by adjusting the MOTOR SPEED potentiometer A1R20 (on 6-Way Table Control Board A1, part number AY40-002T). However, it is recommended that travel time (fully raised to fully lowered) remain in the range of between 10-17 seconds.

1. Locate the MOTOR SPEED potentiometer on 6-Way Table Control Board A1 (see Figure 32 in Chapter 5, Diagrams).
2. Rotating the potentiometer clockwise (CW) increases speed, counterclockwise (CCW) rotation decreases speed.

NOTE

The DC Motor Driver Board A2 has five (5) trimpots identified on the printed circuit board that are factory calibrated and should not require any further adjustment.

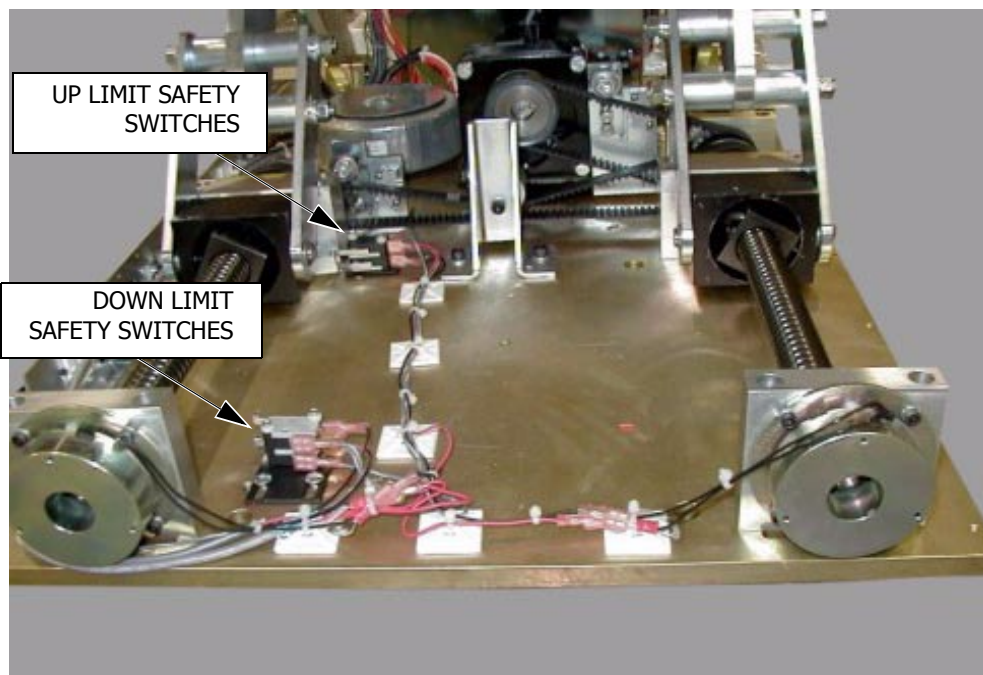


Figure 9. Up/Down Limit Switch Locations

PEDAL DISABLE SWITCH OPERATIONAL CHECK

1. Depress the Pedal Disable Switch until the PEDAL DISABLE SWITCH lamp illuminates.
2. Check that all foot pedal functions are disabled, and check that FLOAT push button is disabled.
3. Depress the Pedal Disable Switch until switch lamp extinguishes.
4. Check that all pedal functions and FLOAT push button are operational.

CHECKING THE OBSTRUCTION SENSORS (ELEVATING TABLE ONLY)

On Model QT-750, the operation of the four (4) Obstruction Sensors (S3-S6) must be verified at installation. The Obstruction Sensors are located at either end of the left and right Transverse Assemblies below each tabletop rail (see Figure 10). Proceed as follows:

1. While the table is driving down, have an assistant lift up the table top (grasping under the rail) at one corner of the table.
2. The table should stop driving down when the table top is lifted with a reasonable amount of force.
3. To adjust obstruction sensors, remove the Table Top Assembly (refer to Tabletop Assembly/Installation procedure in this chapter).
4. Loosen the lower hex nut (underside of Bearing Rail) securing the switch to the Bearing Rail. Turn the upper hex nut on obstruction switch clockwise to increase sensitivity, counterclockwise to decrease sensitivity.
5. Re-tighten the lower hex nut when adjustment is correct.
6. Re-install Tabletop Assembly (refer to Tabletop Assembly/Installation procedure in this chapter).
7. Repeat above steps for each of the other obstruction sensors.

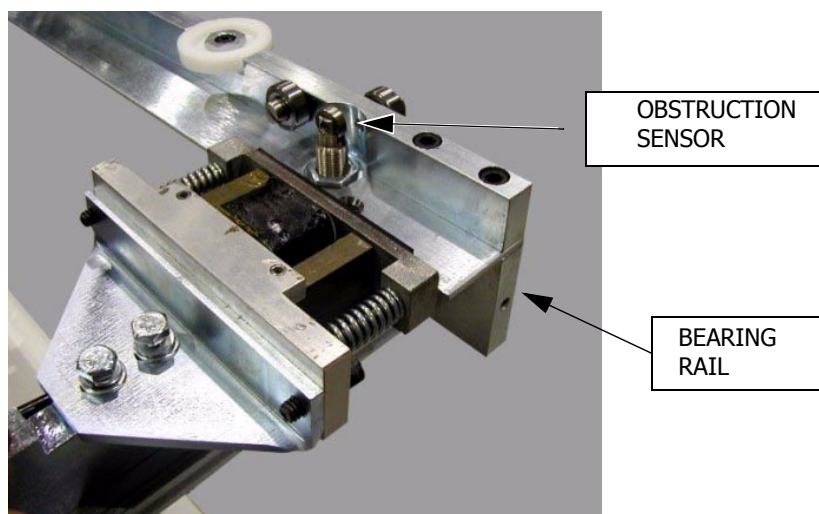


Figure 10. Obstruction Sensor (Typical)

POSITIVE BEAM LIMITATION (PBL) COLLIMATORS

For Positive Beam Limitation (PBL) Collimators and Elevating Tables only, verify the Vertical SID Interlock feature is functioning properly as follows:

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1. Place a 14" x 17" film cassette into the cassette tray and insert the cassette tray into the Receptor Cabinet.
2. Turn on power to the table.
3. Raise the table until it stops.
4. Position the collimator to 40" SID to table image receptor (40" SID LED indicator on tubestand handgrips should be illuminated).
5. The collimator should indicate it is ready for exposure.
6. Depress the DOWN foot pedal. The collimator should now indicate it is not ready for exposure.
7. Try to take an x-ray exposure and verify that no exposure is possible.

MODEL QT-750 COVERS INSTALLATION/ADJUSTMENT PROCEDURE

Proceed as follows after completing all wiring, alignment, and assembly operations:

1. Raise table to full up position.
2. Attach the Lower Rear Cover to aluminum base plate using five (5) 10-32 x 3/8" screws with external tooth star washers (see Figure 11). Do not fully tighten screws at this time.

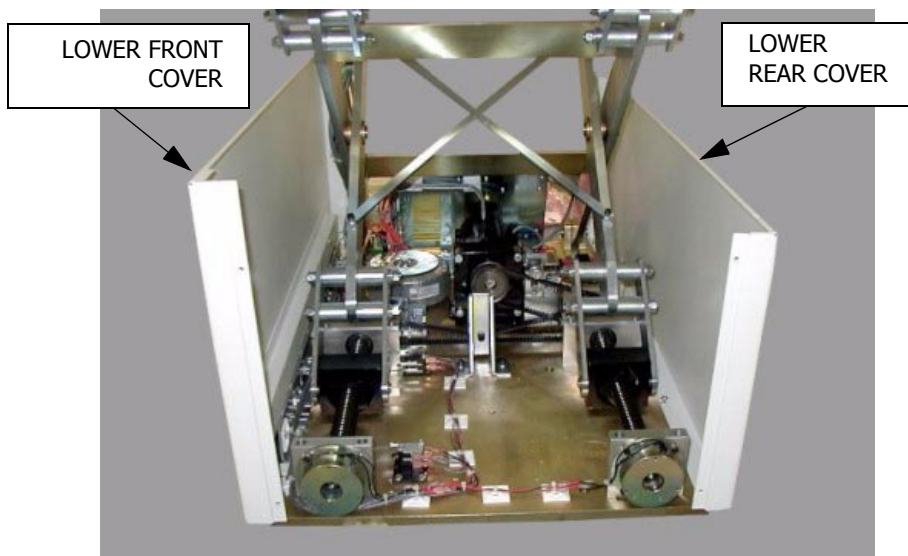


Figure 11. Table Lower Front and Rear Covers Installed

3. Attach the Lower Front Cover to aluminum base plate using four (4) 10-32 x 3/8" screws with external tooth star washers (see Figure 11). Do not fully tighten screws at this time.

4. Attach two (2) Lower Side Covers to Lower Front and Lower Rear Covers using four (4) 6-32 x 3/8" screws with external tooth star washers in each Lower Side Cover (see Figure 12).

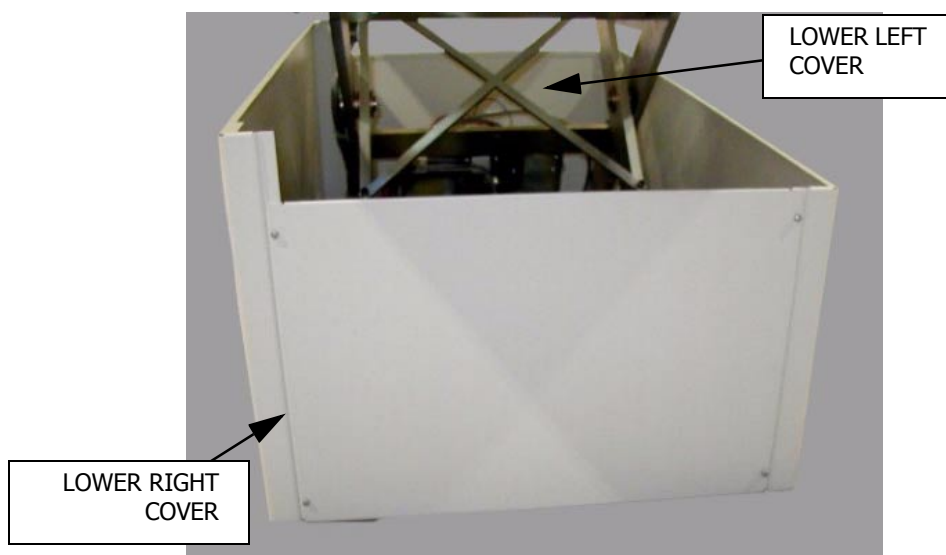


Figure 12. Table Lower Left and Right Covers Installed

5. Lower the table top to check that Scissors Assembly does not interfere with Lower Front and Rear Covers. Adjust covers as necessary. When covers are correctly positioned, tighten all hardware securing lower covers.
6. Attach Upper Front Cover to the tabletop frame using four (4) 10-32 x 3/8" screws with external tooth star washers.
7. Attach Upper Rear Cover to tabletop frame using two (2) 10-32 x 3/8" screws and external tooth star washers and to Upper Front Cover using two (2) 8-32 x 3/8" screws and external tooth star washers.
8. Verify there is adequate clearance for the top covers; test run the table up and down while checking for interference between upper and lower covers.
 - a. If no further cover adjustment is required, remove Upper Front and Rear Covers and fully tighten lower cover mounting screws. Re-install upper covers as described previously. Test run table up and down to verify no interference.
 - b. If adjustment is necessary, adjust lower covers in or out on slots, as required. Re-assemble upper covers and re-check for interference. When position is correct, remove upper covers and fully tighten lower cover mounting screws. Re-install upper covers and test run table to verify no interference.



Figure 13. Upper Rear Cover Installed

Chapter

3

THEORY OF OPERATION



OVERVIEW

Model QT-740 and QT-750 Odyssey HF Series X-ray Generators feature a tabletop that "floats" in four directions for transverse and longitudinal patient positioning. The tabletop of Model QT-750 can also be raised and lowered.

The tabletop floats (rides) on 30 bearings; 26 provide longitudinal tabletop motion, and four are provided for transverse (forward and backward) tabletop motion. The longitudinal bearings are bolted to two precision-machined stainless steel bearing bars, which are mounted below the tabletop on the front and back sides of the table. Four 1-5/8" load bearings bolted on the Transverse Carriage Assembly permit transverse travel of the tabletop. Eight anti-racking and four anti-tipping guide bearings, bolted to the Transverse Carriage Assembly, stabilize tabletop transverse motion by controlling movement of the left and right Transverse Rails.

Two fail-safe brakes (24 VDC electromagnets) are positioned extremely close to the bearing bars. When the electromagnets are de-activated (i.e., FLOAT foot pedal/push button is not pressed), the fail-safe brakes "grab" the bearing bar securely, locking the longitudinal travel of the table. Similarly, two fail-safe brakes (24 VDC electromagnets) are used to grab the Transverse Rails, locking the transverse travel of the table. Depressing either the FLOAT foot pedal(s) or push button energizes the electromagnets, releasing the fail-safe brakes and allowing the tabletop to float freely both longitudinally and transversely.

The Receptor Cabinet rides on four linear ball-bearings mounted to adjustable brackets attached to either side of the cabinet. These bearings travel on the hardened and polished steel shafts of the Receptor Cabinet Carriage. One electromagnet on the underside of the housing "locks" the Receptor Cabinet into place until the Receptor Cabinet Lock Release switch is depressed, thereby releasing the magnet's hold and allowing free movement of the Receptor Cabinet.

The following paragraphs provide theory of operation for Model QT-740 and Model QT-750 Odyssey HF Series X-ray Generators.

MODEL QT-740 TABLE

The table's major electrical components include the AC transformer and fuse block, printed circuit boards, and magnetic locks. See Figures x and x in Chapter 5, Diagrams.

Power Distribution

115/230 VAC line input is applied through fuses F1 and F2 to step-down transformer T1. Transformer T1 provides 18 VAC to 4-Way Table Control Board connector A1J1-1 and A1J1-2. The 18 VAC input is applied to full-wave bridge rectifier A1DB1, filtered by A1C1 and A1C2, and applied through resistor A1R2 and zener diode A1D1 to produce +12 VDC. The +24 VDC output of A1DB1 is connected to A1J1-6 to provide +24 VDC to the bucky, transverse, and longitudinal electromagnets.

Float Control

Model QT-740 tables have one foot pedal and one push button switch (located below the tabletop on the right transverse assembly cover) that control four-way

NOTE

On 115 VAC systems, the power supply cord is the power disconnect device. On 230 VAC systems, the power disconnect device is either the generator circuit breaker (when generator is power source) or the main disconnect (or power cable) on systems wired directly to facility power.

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float top operation. Pressing the foot pedal operates switches S1 and S2, and pressing the push button switch operates switch S3. When S1, S2, or S3 is activated, a negative-going level is applied through normally open (N.O.) PEDAL DISABLE switch S4 and FLOAT switch S1, S2, or S3 to A1C3, which generates a negative-going pulse at one-shot A1U1-2 on 4-Way Table Control Board A1. One-shot A1U1-3 produces a 47-second pulse that turns on FET A1Q1, which provides drive current for the +24 VDC transverse and longitudinal electromagnets. The magnets release the mechanical brakes, allowing tabletop "float" motion. After 47 seconds, or releasing the FLOAT foot pedal or push button (which applies a negative-going level to A1U1-4, resetting A1U1) A1Q1 turns off. The magnets de-energize and lock preventing tabletop "float" motion.

Foot Pedal Disable Circuit

A Foot Pedal Disable Switch S4 is located below the table rail on the left end of the table. Pressing the switch until PEDAL DISABLE SWITCH lamp DS2 is illuminated disconnects FLOAT switches S1, S2, and S3 thereby disabling FLOAT foot pedal and FLOAT push button operation. When the patient is in the correct location for x-ray, disabling the FLOAT foot pedal prevents inadvertent activation of the pedal. When Foot Pedal Disable Switch lamp DS2 is not illuminated, the FLOAT foot pedal and push button are fully operational.

Receptor Cabinet Lock

The Receptor Cabinet magnetic lock has its own release switch (S5) for Receptor Cabinet positioning. When S5 is pressed, the Receptor Cabinet locking magnet is de-energized enabling cabinet movement.

MODEL QT-750 TABLE

The table's major electrical components include the AC transformer and fuse block, printed circuit boards, magnetic locks, and DC motor. Vertical table motion is performed by a motor-driven twin lead screw assembly mounted on the table base. The DC motor drives the twin lead screw assembly via belt connection, which extends (upward) and retracts (downward) the Scissors Assembly when the UP or DOWN foot pedal, respectively, is depressed. See Figures x and x in Chapter 5, Diagrams.

Power Distribution

115/230 VAC line input is applied through terminal board TB1, fuses F1 and F2, and line filter FL1 and to AC transformer T1. Transformer T1 provides 20 VAC to 6-Way Table Control Board A1. Transformer T1 also provides 110 VAC to DC Motor Driver A2 (AC terminals) and to 6-Way Table Control Board connector A1J1-15 and A1J1-16.

Voltage Regulation

From AC transformer T1, 20 VAC is supplied to 6-Way Table Control Board A1 at connector pins A1J5-1 and A1J5-3 (see Figure 27). Fuse protection for 20 VAC input is provided by fuse A1F2. The 20 VAC is rectified and filtered by bridge rectifier A1DB1 and capacitors A1C20 and A1C21 to produce 24-28 VDC unregulated voltage. The +24 VDC is monitored by comparator A1U5B; if the voltage level falls below 15% nominal, a motor drive inhibit signal is output from A1U5B-7

through diodes A1D18 and A1D17 to A1U4B and A1U4D, respectively, de-energizing A1K1, A1K3 and A1K4. When A1K1 or A1K3 are de-energized along with A1K4, operation of the DC motor is disabled. The +24 VDC output is supplied to 15-volt regulator A1U7, which produces regulated +15 VDC. The +15 VDC is input to regulator A1U8, which produces +5 VDC for the 6-Way Table Control Board components.

Table Up Motion Control

When the UP foot pedal is depressed, switch S1 contact is connected to ground. The ground is applied through 6-Way Table Control Board connector A1J2-1 as an active low /UP signal, which is input to NOR gate A1U2A. This produces a high output at A1U2A-1, which is inverted low by A1U4B. The output from A1U4B energizes the coil of UP relay A1K1 through 150 ms delay circuit A1U1A, A1C5, A1R5, A1R6, and A1U4A1U4A. (Since A1U4B's output is a low-going signal, A1C5 discharges in approximately 1 millisecond through A1D2 and A1R5, which immediately energizes A1K1). When A1K1 is energized, the CONTROLLER(-) signal from DC Motor Driver Board A2 is connected to the DC motor (through A1J1-10) as the MOTOR signal. The low-going signal from A1U4B is also applied to A1D10 (through A1D9) and A1R21 to discharge A1C9 to a voltage level that will cause the output of A1U1C to go low in approximately 150 milliseconds. This energizes A1K4, which removes the connection from A1J1-1 and A1J1-9, thus allowing the DC motor to rotate. The INHIBIT outputs are applied through A1J1-9 and A1J1-1 to DC Motor Driver Board A2 H1 and H2 terminals. Relays A1K5 and A1K6 are also energized in a similar fashion, which releases the Motor Brake and redundant Table Brake. The delay of 150 milliseconds allows A1K1 to energize before A1K4 energizes. A similar sequence occurs in reverse when the UP foot pedal is released; A1K4, A1K5, and A1K6 are de-energized in approximately 1 millisecond, then A1K1 is de-energized approximately 150 milliseconds later. At the same time, the /DN signal applied through connector A1J2-11 is inactive high, and DOWN relay A1K3 is de-energized (through components A1U2C, A1U2D, A1U4D, A1U1B, A1U4C). As a result, the CONTROLLER(+) signal from DC Motor Driver Board A2 is routed to the DC motor (through A1J1-12) as the MOTOR+BRK RES signal. This causes the motor to drive the Scissors Assembly upwards. (The brake resistor is not actually applied across the motor when it is driving up, DOWN relay A1K2 must be energized as described to connect the braking resistors to the motor during table down motion.)

Table up motion is stopped in any of the following ways:

- When the UP foot pedal is released, the /UP signal returns to an inactive high level, de-energizing UP relay A1K1 through A1D21, A1U4B, A1U1A, and A1U4A and INHIBIT relay A1K4 through A1U2A, A1U4B, and A1U1C. When de-energized, the CONTROLLER(-) input is open, disabling the DC motor. Releasing the UP foot pedal before 24 seconds will cause a low level to be applied to A1U6A-3, thereby resetting A1U6A and stopping tabletop vertical motion.
- After 24 seconds from the time the active low /UP signal was first applied, the output at one-shot A1U6A-6 returns to a low level. (A1U6A

Chapter 3 Theory of Operation

was triggered by the UP signal produced by A1U2C-10.) The low output from A1U6A-6 de-energizes UP relay A1K1 through components A1D18, A1U4B, A1U1A, and A1U4A and INHIBIT relay A1K4 through A1U2A, A1U4B, and A1U1C. The motor drive circuit is interrupted, thereby stopping tabletop vertical motion.

- Limitation of upward travel for the Scissors Assembly is accomplished by Up Limit switch S8 and redundant Up Limit switch S9. The switches are mounted on the table base plate close to the Ball Nut Assemblies, which interface the Scissors Assembly with the lead screws. When the tabletop is raised, the lead screws drive the Ball Nut Assemblies toward the Up Limit Switches. At the point where switches S8 and/or S9 are activated (contacts open), a high UP LIMIT signal is applied through A1J2-14 to buffer/level shifter A1U3F. The low output from A1U3F de-energizes UP relay A1K1 through components A1D11, A1U4B, A1U1A, and A1U4A and INHIBIT relay A1K4 through A1D11, A1U4B, and A1U1C. The motor drive circuit is interrupted, thereby stopping tabletop vertical motion.
- A sensor is located on the Drive and Sync belts to detect the presence of each belt. Normally, Drive Belt Sensor Switch S22 and Sync Belt Sensor Switch S23 are closed applying a low (ground) through A1J2-19 to transistor A1Q4. The low signal turns off A1Q4, causing the input at A1U5B-5 to be high. The resulting low output at A1U5B-7 enables the motor drive circuit for operation as described previously. In the event a belt breaks, S22 and/or S23 open removing the ground at A1J2-19. Transistor A1Q4 turns on applying a low input to A1U5B-5, which outputs a high signal at A1U5B-7. The motor drive circuit is interrupted, thereby disabling DC motor operation.
- An temperature monitoring sensor mounted on the DC Motor monitors its temperature. If the temperature exceeds 70°C, the switch opens and disables the DC Motor operation in the same manner as the drive belt sensors, described in the previous paragraph.

Table Down Motion Control

When the DOWN foot pedal is depressed, switch S2 contact is connected to ground. The ground is applied through 6-Way Table Control Board connector A1J2-11 as an active low /DN signal, which is input to NOR gate A1U2D. This produces a high output at A1U2D-13, which is inverted low by A1U4D. The output from A1U4D energizes the coil of DOWN relay A1K3 through 150 ms delay circuit A1U1B, A1C8, A1R16, A1R14, and A1U4C. (Since A1U4D's output is a low-going signal, A1C8 discharges in approximately 1 millisecond through A1D7 and A1R14, which immediately energizes A1K3). When A1K3 is energized, the CONTROLLER(-) signal from DC Motor Driver Board A2 is connected to the DC motor (through A1J1-12) as the MOTOR+BRK RES signal. The low-going signal from A1U4D is also applied to A1D10 and A1R22 to discharge A1C9 to a voltage level that will cause the output of A1U1C to go low in approximately 150 milliseconds. This energizes A1K4, which removes the connection from A1J1-1 and A1J1-9, thus allowing the DC motor to rotate. The INHIBIT outputs are applied through

A1J1-9 and A1J1-1 to DC Motor Driver Board A2 H1 and H2 terminals. A1K5 and A1K6 are also energized in a similar fashion, which releases the Motor Brake and redundant Table Brake. The delay of 150 milliseconds allows A1K3 to energize before A1K4 energizes. A similar sequence occurs in reverse when the UP foot pedal is released; A1K4, A1K5, and A1K6 are de-energized in approximately 1 millisecond and then A1K3 is de-energized approximately 150 milliseconds later. At the same time, the /UP signal applied through connector A1J2-1 is inactive high, and UP relay A1K1 is de-energized (through components A1U2A, A1U4B, A1U1A, and A1U4A). As a result, the CONTROLLER(+) signal from DC Motor Driver Board A2 is routed to the DC motor (through A1J1-10) as the MOTOR signal. This causes the motor to drive the Scissors Assembly downwards.

To control downward motor speed, resistors R1 through R4 are placed in parallel with the DC motor. The resistors are connected to 6-Way Table Control Board connector A1J1-2 and A1J1-12. When the /DN signal is active, DOWN relay A1K2 is energized connecting brake resistors R1 - R4 in parallel with the DC motor at A1J1-12 and A1J1-2.

Table down motion is stopped in any of the following ways:

- When the DOWN foot pedal is released, the /DN signal returns to an inactive high level, de-energizing DOWN relay A1K3 through A1U2D, A1U4D, A1U1B, and A1U4C and INHIBIT relay A1K4 through A1U2A, A1U4B, and A1U1C. When de-energized, the CONTROLLER(-) input is open, disabling the DC motor.
- After 24 seconds from the time the active low /DN signal was first applied, the output at one-shot A1U6A-6 returns to a low level. (A1U6A was triggered by the DN signal produced by A1U2B-4.) The low output from A1U6A-6 de-energizes DOWN relay A1K3 through components A1D17, A1U4D, A1U1B, and A1U4C and INHIBIT relay A1K4 through A1U2D, A1U4D, and A1U1C. The motor drive circuit is interrupted thereby stopping tabletop vertical motion. Releasing the DOWN foot pedal before 24 seconds will cause a low level to be applied to A1U6A-3, thereby resetting A1U6A and stopping tabletop vertical motion.
- An Obstruction Sensor (S3-S6) is located at each end of the Transverse Assemblies below the tabletop frame. The function of the Obstruction Sensors is to disable table motion in the event that an object, such as a chair, table, etc., becomes wedged below the tabletop as it is traveling downward. This feature is designed to avoid damage to the table only and is not intended as a safeguard against personal injury. Activation of any obstruction switch (S3-S6) applies a motion inhibit signal that de-energizes relays A1K3 and A1K4, thereby disabling DC motor operation.
- Limitation of downward travel of the Scissors Assembly is accomplished by Down Limit switch S7 and redundant Down Limit switch S10. The switches are mounted on the table base plate close to the Ball Nut Assemblies. When the tabletop is lowered, the lead screws drive the Ball Nut Assemblies toward the Down Limit Switches. At the point where switches S7 and/or S10 are activated, a low DN LIMIT signal is applied

Chapter 3 Theory of Operation

through A1J2-4 and/or A1J2-5, respectively, to buffer/level shifters A1U3E and A1U3G. The high outputs from A1U3E and A1U3G de-energize DOWN relay A1K3 through components A1U4D, A1U1B, and A1U4C and INHIBIT relay A1K4 through A1U4D and A1U1C. The motor drive circuit is interrupted, thereby stopping tabletop vertical motion.

- A sensor is located on the Drive and Sync belts to detect the presence of each belt. Normally, Drive Belt Sensor Switch S22 and Sync Belt Sensor Switch S23 are closed applying a low (ground) through A1J2-19 to transistor A1Q4. The low signal turns off A1Q4, causing the input at A1U5B-5 to be high. The resulting low output at A1U5B-7 enables the motor drive circuit for operation as described previously. In the event a belt breaks, S22 and/or S23 open removing the ground at A1J2-19. Transistor A1Q4 turns on applying a low input to A1U5B-5, which outputs a high signal at A1U5B-7. The motor drive circuit is interrupted, thereby disabling DC motor operation.
- An temperature monitoring sensor mounted on the DC Motor monitors its temperature. If the temperature exceeds 70°C, the switch opens and disables the DC Motor operation in the same manner as the drive belt sensors, described in the previous paragraph.

Float Control

Model QT-750 tables have two FLOAT foot pedals, which operate switches S11 and S12 and a FLOAT push button switch (S13) located on the right Transverse Assembly cover, just below the tabletop. When S11, S12, or S13 is activated, a high FLOAT signal is applied through 6-Way Table Control Board connector A1J2-18 to one-shot A1U6B. One-shot A1U6B produces a 47 second pulse that turns on FET's A1Q1 and A1Q2 (through buffer/level shifter A1U4F), which provides drive current for the +24 VDC transverse and longitudinal electromagnets. The magnets release the mechanical brakes allowing tabletop "float" motion. After 47 seconds, A1U6B times out and A1Q1 turns off. Releasing the FLOAT foot pedal or push button before 47 seconds will cause a low level to be applied to A1U6B-13, thereby resetting A1U6B and turning off A1Q1 and A1Q2. The magnets de-energize and the fail-safe brakes lock, preventing tabletop "float" motion.

Foot Pedal Disable Switch

Foot Pedal Disable Switch S14 is located below the table rail on the left end of the table. Pressing the switch until the PEDAL DISABLE SWITCH lamp DS2 is illuminated disables foot pedal operation via comparator A1U5A. When the patient is in the correct location for x-ray, disabling the foot pedals prevents inadvertent activation of the pedals. When the Foot Pedal Disable Switch lamp DS2 is not illuminated, the foot pedals are fully operational.

Positive Beam Limitation

When the table is used in a PBL system, the UP LIMIT signal is used to prevent exposures when the table is not in its full up position (i.e., at 40" SID). Relay A1K7 is energized when the table is at its maximum up position (as indicated when the /UP LIMIT signal is active low) to indicate the 40" SID position via relay

contact closure at A1J4-1 and A1J4-2. This contact closure would be fed to the table's PBL circuit to indicate the 40" SID position.

Receptor Cabinet Lock

The Receptor Cabinet magnetic lock has its own release switch (S15) for Receptor Cabinet positioning. When S15 is pressed, the Receptor Cabinet locking magnet is de-energized enabling cabinet movement.

Emergency Stop Switch

The Emergency Stop switch (S16) is a two-position push-button switch connected across the 110 VAC secondary of transformer T1. Pressing the switch breaks the 110 VAC input connection applied to DC Motor Driver Board A2 (at one AC terminal) thereby removing power from the table DC motor drive circuit. To restore power, the switch must be manually released to the normally closed position.

In addition to providing an emergency shut-off function, the Emergency Stop Switch serves as an indicator lamp that flashes at a 1-Hertz rate in the event one of the following "faults" occur:

- Any of the obstruction sensors (S3 - S6) are activated (during tabletop down movement)
- A drive belt fault condition occurs (i.e. snapped or disengaged belt), sensed by normally-closed MOTOR BELT switch S22
- A sync belt fault condition occurs (i.e. snapped or disengaged belt), sensed by normally-closed SYNC BELT switch S23
- DC Motor over temperature fault occurs (motor temperature exceeds 70°C), sensed by DC Motor thermal switch S21
- The 20 VAC input from transformer T1 falls below 15% nominal
- Redundant down limit switch S2 or redundant up limit switch S9 is activated

When any of the above conditions occur, a low-to-high transition is applied to oscillator A1U8-4, which causes a 1-Hz square wave output at A1U8-3. The output from A1U8-3 turns transistor A1Q4 on and off, generating the FLASH signal that drives the EMERGENCY SWITCH LAMP DS1 through connector A1J2-10.

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Chapter

4

SERVICE INSTRUCTIONS



OVERVIEW

This chapter is designed to assist the service technician in maintaining the smooth operation of the table. The table will function reliably when maintained according to the instructions provided in this chapter. Only properly trained service personnel should service or maintain this equipment. Safe equipment performance requires the attention of service personnel who are specifically trained and experienced with medical x-ray apparatus. Applicable preventive maintenance or any repair service should be performed by these skilled individuals. Failure to follow manufacturer's or service personnel's recommendations may result in serious injury



WARNING! Personnel engaged in maintenance activities should exercise normal caution and care while working with electromechanical equipment. Before removing or opening any electrical power panels or covers, verify that the incoming power supply is turned OFF. In the event maintenance procedures require power to be supplied to the unit, extreme care MUST be exercised to insure the safety of service or other personnel in the area. When working on the Scissors Assembly, be sure the Safety Bracket is installed (see Figure 14). Verify that the equipment is properly grounded before attempting any electrical operation.

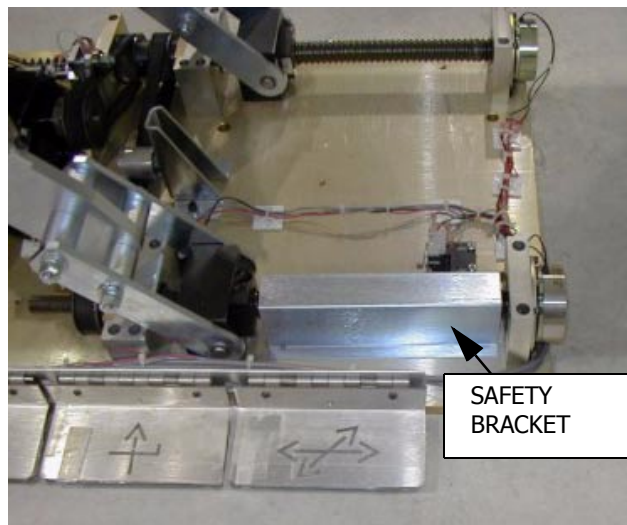


Figure 14. Safety Bracket Installed

Chapter 4 Service Instructions

SERVICE MAINTENANCE



WARNING! Always disconnect the equipment from the main power supply prior to any cleaning.

Visual Inspection

A complete series of inspections and functional checks was conducted at installation to insure proper operation of the system. The following inspection and adjustment procedures are recommended to maintain the system in its original operating condition.

Perform Every Six Months:

- Check for evidence of loose hardware or loose wires
- Check all bearings and bearing surfaces for cleanliness and corrosion
- Clean Bearing Tracks
- Conduct a general inspection for worn or damaged parts
- Inspect Drive and Sync belts for wear, cracks, looseness
- Check for smoothness of Receptor Cabinet motion
- Verify that all ground conductors are properly and securely installed and free of corrosion or damage
- Check all electrical cabling and wiring for wear and fraying
- Perform an operational test and check table travel and positions (applicable to Model QT-750 only)
- Check external covers for proper fit, inspect for scratches that may indicate cover misalignment

Functional Check for Model QT-750 Elevating Tables

1. Raise the table to the full up position and then turn power off.
2. Remove the upper and lower covers from the table as follows:



WARNING! On Model QT-750 tables, a Safety Bracket (provided with Model QT-750 tables) is used to prevent collapse of the Scissors Assembly onto the table base plate during servicing. Verify Safety Bracket is in place prior to servicing around or below the Scissors Assembly.

3. Check mounting hardware that mounts table base to the floor for a secure, tight fit. Be sure to check all six (6) mounting points.
4. Lubricate two (2) Lead Screw shafts using NGLI no. 1 grease (Lubriplate MAG-1 Polymer Grease, part number L0189-098, or equivalent).

5. Lubricate points as shown in Figures 13 and 14. Use light weight machine quality oil only!

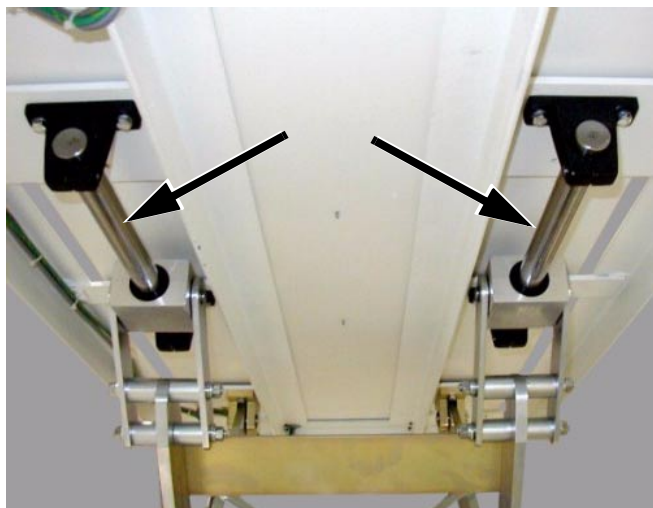


Figure 15. Lubrication Points - Table Frame Thompson Shafts

6. Turn power on to the table.

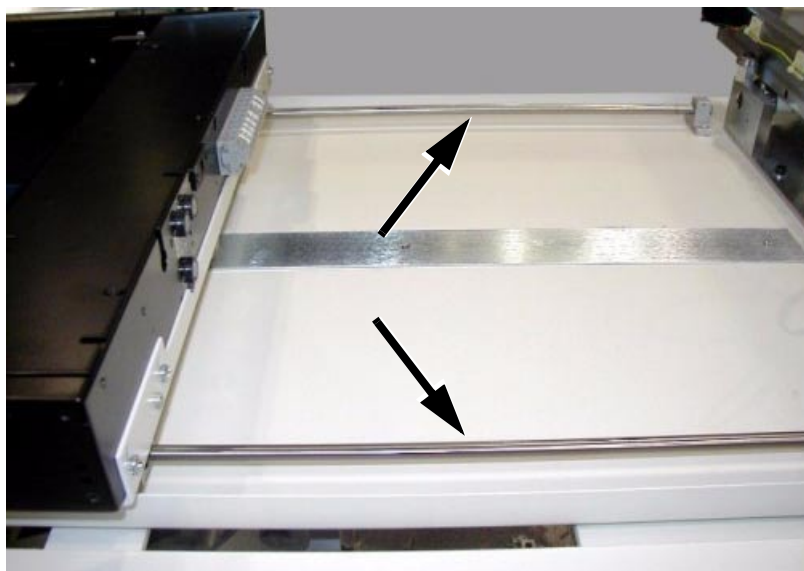


Figure 16. Lubrication Points - Bucky Thompson Shafts

Chapter 4 Service Instructions



WARNING! Exercise extreme care to insure the safety of service or other personnel in the area. DO NOT insert hands, tools, etc., into the Scissors Assembly area while power is on.

7. Check table travel by driving the table down and then up. Make sure that nothing is binding or pulling during the up/down travel movement.
8. On PBL systems, verify table/collimator S.I.D. Interlock feature operates correctly.
9. Replace the upper and lower table covers (refer to Assembly and Installation, Chapter 2).
10. Place a loaded cassette into the bucky tray and take a projection. Inspect the film to determine whether the bucky and collimator are still in alignment.

Lubrication

Model QT-750 tables require lubrication at the locations shown in Figures 15 and 16 at least every twelve months. Model QT-740 requires lubrication at the locations shown in Figure 16 at least every twelve months.

REMOVAL/REPLACEMENT PROCEDURES

The following procedures provide step-by-step instructions for removal and replacement of the repairable components in the table.

Replacing the Drive Belt (Model QT-750 Tables Only)



WARNING! Make sure to remove any objects from the tabletop before continuing.

1. Raise the table to the full up position and then turn power off.
2. Remove upper and lower table covers.
3. Install Service Safety Bracket.
4. Remove four (4) hex bolts securing the DC Motor to Table Base Plate (see Figure 17).
5. Remove Drive Belt from pulley.
6. Install replacement Drive Belt on pulley.
7. Install, but do not tighten, four (4) hex bolts securing DC Motor to the Table Base Plate.
8. Adjust belt tension by sliding DC Motor toward front end of Table Base Plate. When belt tension is set, tighten DC Motor mounting screws.

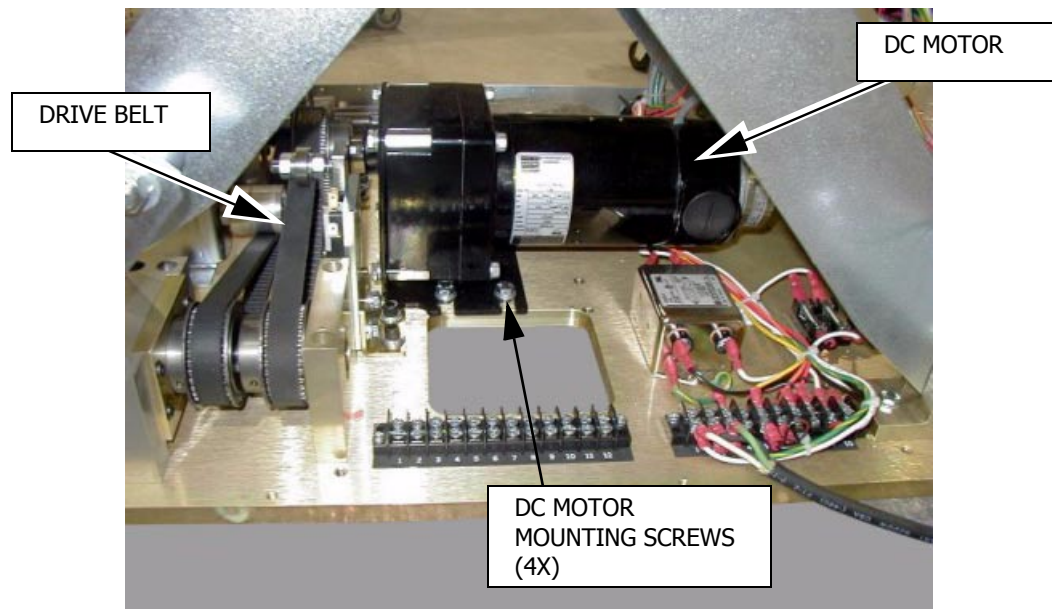


Figure 17. DC Motor Location

9. Verify Drive Belt Safety Switch is in open position (if not, motor will not operate). Adjust switch height if necessary.
10. Remove Safety Bracket.
11. Reinstall upper and lower table covers (refer to Chapter 2, Assembly and Installation).
12. Turn on power. Perform an operational test and check table travel and positions.

Replacing the Sync Belt (Model QT-750 Tables Only)



WARNING! Remove any objects from the tabletop before continuing.

1. Raise the table to the full up position and then turn power off.
2. Remove upper and lower table covers.
3. Install Service Safety Bracket.
4. Remove four (4) hex bolts securing the DC Motor to the Table Base Plate (see Figure 17).
5. Remove Drive Belt from pulley.

Chapter 4 Service Instructions

6. Loosen two (2) bolts securing Sync Belt Switch to Sync Belt Switch Bracket and remove Sync Belt Switch and set aside. (Do not disconnect switch wires).

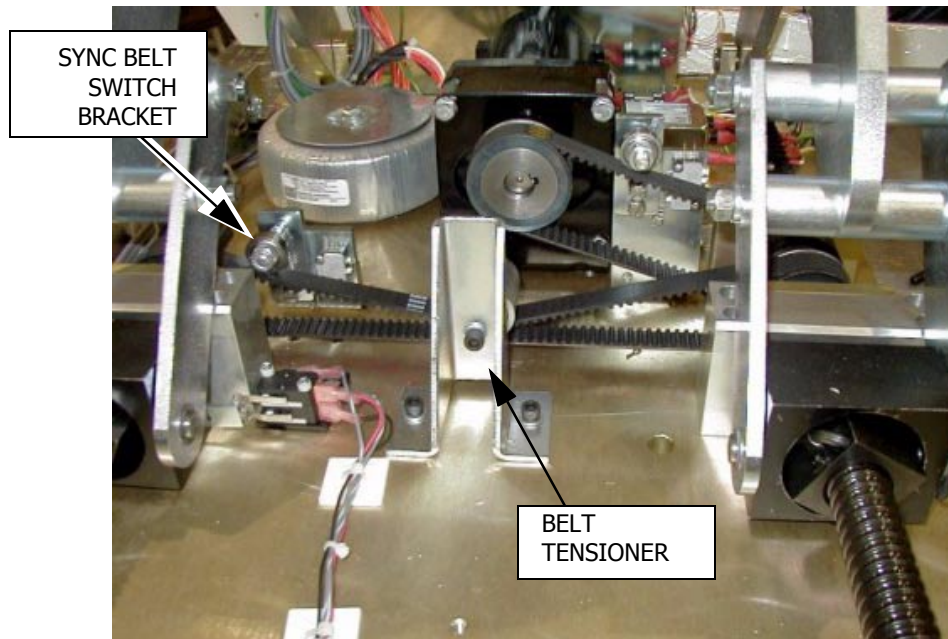


Figure 18. Location of Sync Belt Switch Bracket and Tensioner

7. Loosen nut on Belt Tensioner to create slack in belt (see Figure 18). If necessary, remove Belt Tensioner to achieve sufficient slack for belt removal.
8. Loosen two (2) 1/4-20 socket head cap screws securing Ball Screw Mounting Block at pulley end of Lead Screw to Base Plate (see Figure 18). Gently tap Block to remove it from Lead Screw.
9. Remove Sync Belt from pulleys.
10. Install replacement Sync Belt on pulleys.
11. Verify the distance between Ball Nut Blocks and center Ball Screw Mounting Blocks (see Figure 19) are equal (± 0.003 "). If not, rotate either shaft until distances are equal (within tolerance). This is to ensure equal torque on both Lead Screws.
12. Install Ball Screw Mounting Block on pulley end of Lead Screw and secure to Table Base Plate using two (2) 1/4-20 socket head cap screws.

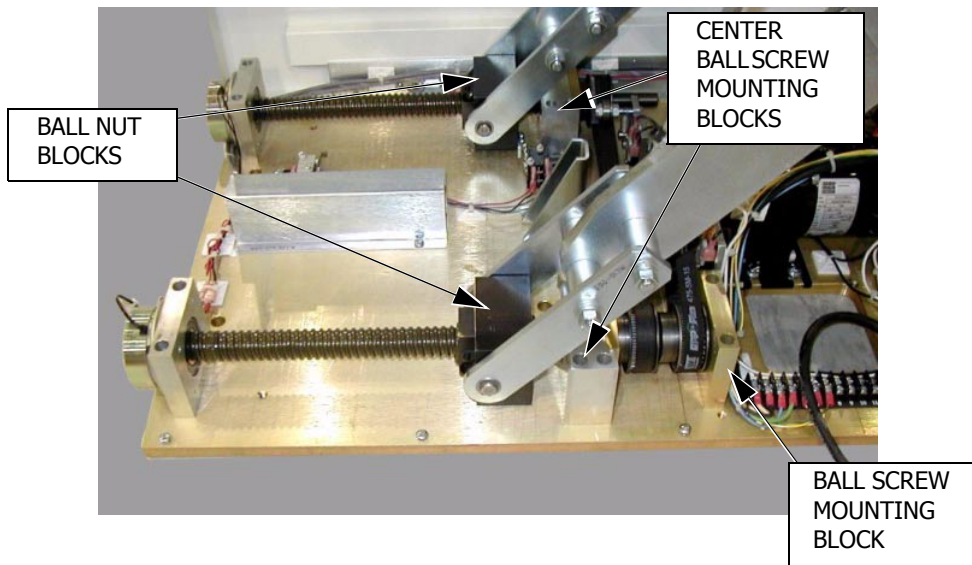


Figure 19. Ball Nut and Screw Mounting Block Locations

13. Re-install Belt Tensioner (if removed). Adjust belt tension as follows:
 - a. If not already done so, loosen nut on Belt Tensioner.
 - b. Increase belt tension by adjusting Belt Tensioner downward. The belt is properly tensioned when, at the midpoint of the longest belt span, there is approximately 1/4" deflection.
 - c. When belt tension is set, tighten nut on Belt Tensioner.
14. Verify Sync Belt Safety Switch is in open position (if not, motor will not operate). Adjust switch height if necessary.
15. Remove Safety Bracket.
16. Reinstall upper and lower table covers (refer to Chapter 2, Assembly and Installation).
17. Turn on power. Perform an operational test and check table travel and positions.

Replacing the DC Motor (Model QT-750 Tables Only)

1. Raise the table to the full up position and then turn power off.
2. Remove upper and lower table covers.
3. Install Service Safety Bracket.
4. Cut the two DC Motor wires connected to 6-Way Table Control Board A1 connectors A1J1-12 and A1J1-10.
5. Remove four (4) hex bolts securing the DC Motor to the Table Base Plate (see Figure 17).
6. Remove Drive Belt from DC Motor pulley.
7. Loosen set screw securing pulley to motor shaft and remove pulley from shaft. Retain pulley (and key) for re-assembly.
8. Slide pulley (with key inserted) onto shaft of replacement DC Motor.
9. Reinstall Drive Belt on DC Motor Pulley.
10. Mount DC Motor to Table Base Plate using four (4) hex bolts.
11. Be sure pulley on DC Motor is aligned with pulley on Lead Screw to within $\pm 1/16"$. After adjusting pulley position, tighten set screw on DC Motor pulley.
12. Connect replacement DC Motor wires to 6-Way Table Control Board connector A1J1-12 and A1J1-10.
13. Verify Drive Belt Safety Switch is in open position (if not, motor will not operate). Adjust switch height if necessary.
14. Remove Safety Bracket.
15. Reinstall upper and lower table covers (refer to Chapter 2, Assembly and Installation).
16. Turn on power. Perform an operational test and check table travel and positions.

Replacing the DC Motor Driver Board A2 (Model QT-750 Tables Only)

To replace the DC Motor Driver Board A2, proceed as follows:

1. Raise the table to the full up position and then turn power off.
2. Remove upper and lower table covers.
3. Install Service Safety Bracket.



WARNING! To prevent electrical shock hazards, make sure power is off and all capacitors are discharged before proceeding.

4. Disconnect plug from connector on DC Motor Driver Board A2.
5. Remove four (4) screws securing DC Motor Driver Board A2 to Board Mounting Bracket and remove board. Retain screws for re-assembly.
6. On replacement DC Motor Driver Board A2, verify that all five potentiometers are turned fully clockwise (see Figure 20).
7. Set DIP switches 1-8 on DC Motor Driver Board A2 as follows:
 - 1 = OFF
 - 2 = ON
 - 3 = ON
 - 4 = OFF
 - 5 = ON
 - 6 = OFF
 - 7 = OFF
 - 8 = ON
8. Position replacement DC Motor Driver Board A2 on Board Mounting Bracket and secure using screws removed in previous step.
9. Connect plug into connector on DC Motor Driver Board A2.

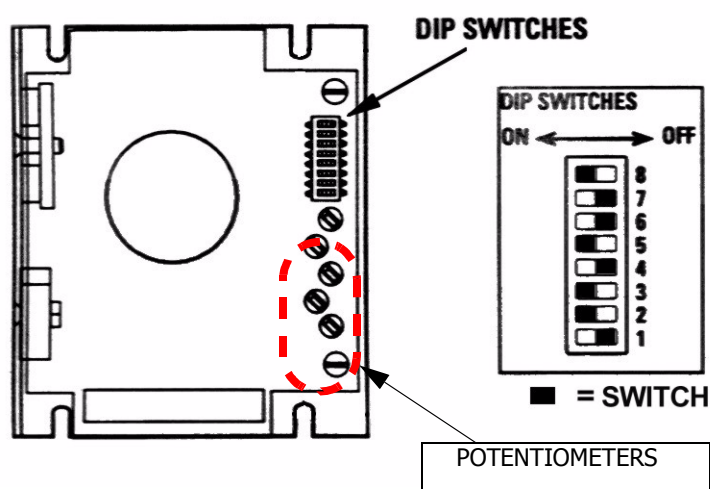


Figure 20. DC Motor Driver Board A2 Layout

10. Remove Safety Bracket.
11. Reinstall upper and lower table covers (refer to Chapter 2, Assembly and Installation).
12. Turn on power. Perform an operational test and check table travel and positions.
13. If necessary, readjust MOTOR SPEED potentiometer R20 on 6-Way Table Control Board A1. (It is recommended that the travel time (fully raised to fully lowered) remain in the range of between 10-17 seconds.)

Chapter 4 Service Instructions

Receptor Cabinet Removal/Replacement

The following procedure is performed with the radiographic portion of the tabletop removed. To remove the radiographic portion of the tabletop, lift up at one corner and pull off tabletop.



WARNING! To prevent electrical shock hazards, make sure power is off before proceeding.

1. On systems equipped with a moving grid (bucky), tag and disconnect wires connected to bucky terminal strip.
2. Remove eight (8) 10-32 x 1/2" screws securing Receptor Cabinet to Receptor Cabinet Mounting Bracket and remove cabinet.
3. Place new Receptor Cabinet inside Receptor Cabinet Mounting Brackets and install eight (8) 10-32 x 1/2" screws. Do not tighten screws.
4. Position Receptor Cabinet in brackets so that the distance measured from the top of the Table Frame to the top of the receptor cabinet is 4.25" (see Figure 21) at all four corners. When this position is achieved, tighten Receptor Cabinet mounting screws.
5. Install radiographic portion of the tabletop. Slide the Receptor Cabinet from one end of the table to the other and ensure that the movement is smooth. If not, re-check measurements as described in the previous step.

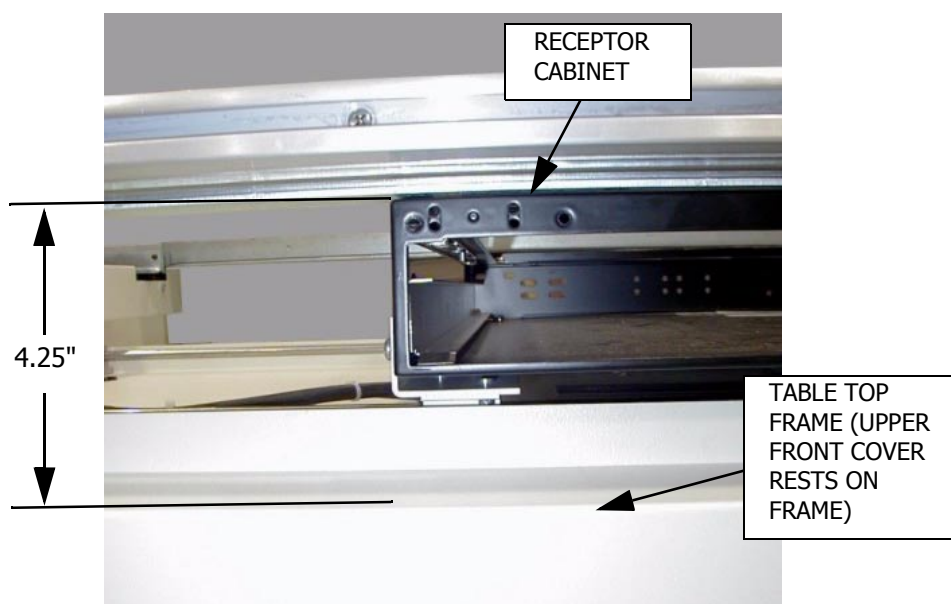


Figure 21. Correct Distance for Receptor Cabinet Installation

Cassette Tray Removal Procedure

To remove the cassette tray from the housing for cleaning or repair, proceed as follows:

1. Float the tabletop fully back.
2. Pull the cassette tray out by the handle until it stops.
3. Grasp both sides of the tray with your right hand placed near the table and your left hand towards the tray front.
4. Locate the finger hole on the right side of the tray bottom. A spring-loaded plate covers this hole. Press the plate with your right index finger, lift the cassette tray up slightly and pull the tray away from the housing.

REPLACEMENT PARTS AND ORDERING INFORMATION

Table 2 provides a list of replaceable parts for the table. Figures 22 through 28 show the locations of the replaceable parts in the system.

Table 2. Replaceable Parts

Item	Description	Part Number	Model(s) Used On	Qty Used in System
1	Foot Pedal/Up/Down Limit Switches	EL50-006	QT-740 QT-750	1 8
2	4-Way Table Control Board	AY40-017T	QT-740	1
3	6-Way Table Control Board	AY40-002T	QT-750	1
4	AC Transformer	EL55-010	QT-740	1
5	Fuse, 2 Amp (115 VAC Input) Fuse, 1 Amp (230 VAC Input)	EL45-008 EL45-007	QT-740	1
6	Small Magnet	EL58-003	QT-740 QT-750	4 4
7	Bucky Locking Magnet	EL58-004	QT-740 QT-750	1 1
8	Switch, Emergency Shut Off	EL50-009	QT-750	1
9	Switch, Foot Pedal Disable	EL50-014	QT-750	1

Chapter 4 Service Instructions

Item	Description	Part Number	Model(s) Used On	Qty Used in System
10	Switch, FLOAT Push Button	EL50-002	QT-750 QT-740	1 1
11	AC Transformer	EL55-008	QT-750	1
12	DC Motor Driver Board	EL67-002	QT-750	1
13	DC Motor	EL66-001	QT-750	1
14	Line Filter	EL99-001	QT-750	1
15	Fuse, 6 Amp (115 VAC Input) Fuse, 3 Amp (230 VAC Input)	EL45-006 EL45-009	QT-750	1
16	Brake, Fail-Safe, Lead Screw	EL80-002	QT-750	2
17	Brake, Fail-Safe, DC Motor	EL80-001	QT-750	1
18	Belt, Drive	ME46-004	QT-750	1
19	Belt, Sync	ME46-005	QT-750	1

ORDERING INFORMATION

To order replacement parts for the tubestand, contact the Service Department at;

Quantum Medical Imaging, LLC.
2905 Veterans Memorial Highway
Ronkonkoma, New York 11779 USA
Phone: (631) 587-5800

When ordering replacement parts, supply the following information:

- Model and serial number of equipment
- Part number
- Part description
- Quantity required

When ordering components or parts not listed in Table 2, a complete description of the part, including its function and location should be provided with the model number and serial number of the unit.

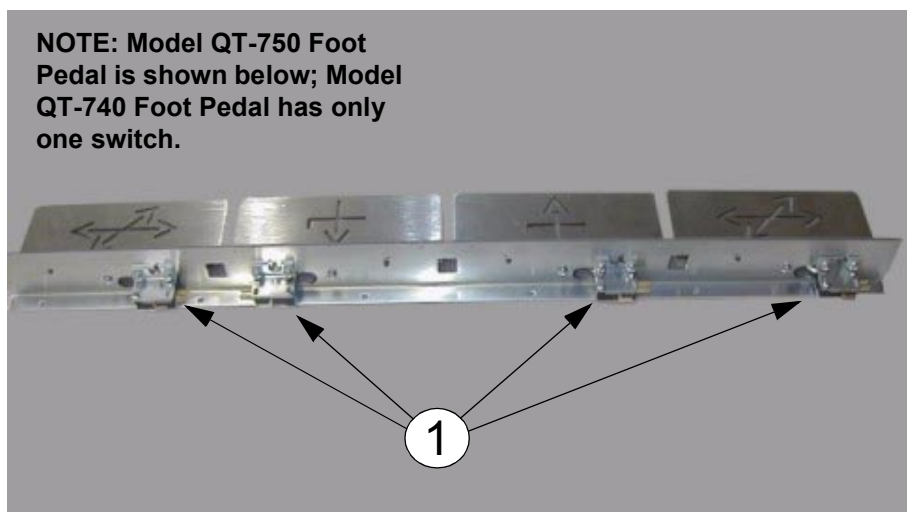


Figure 22. Replaceable Parts Location Diagram

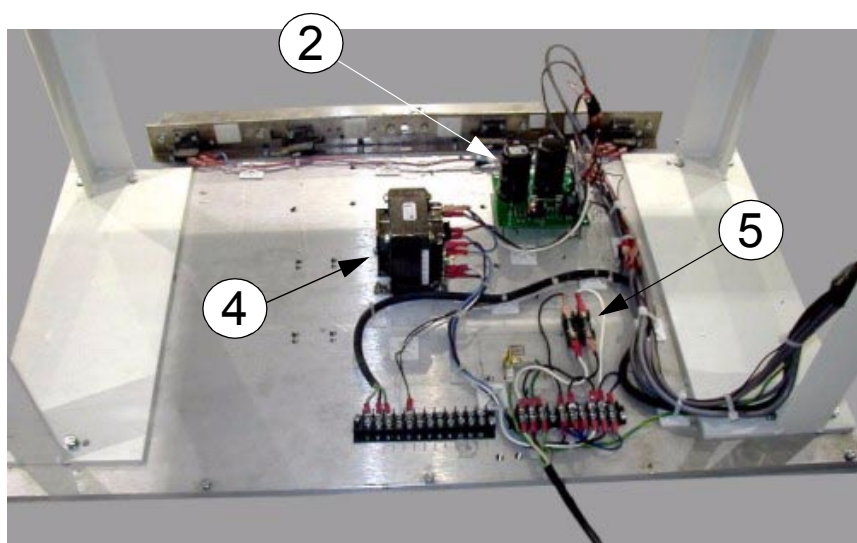


Figure 23. Replaceable Parts Location Diagram

Chapter 4 Service Instructions

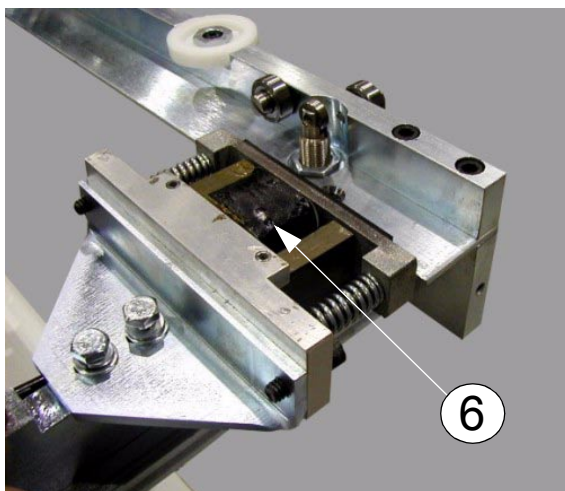


Figure 24. Replaceable Parts Location Diagram

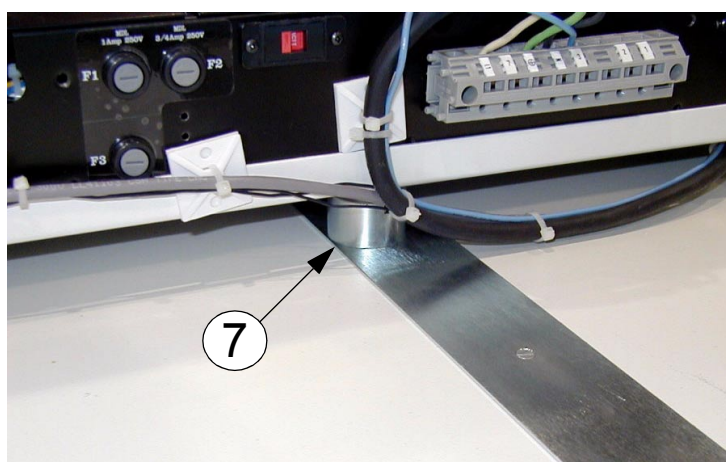


Figure 25. Replaceable Parts Location Diagram



Figure 26. Replaceable Parts Location Diagram

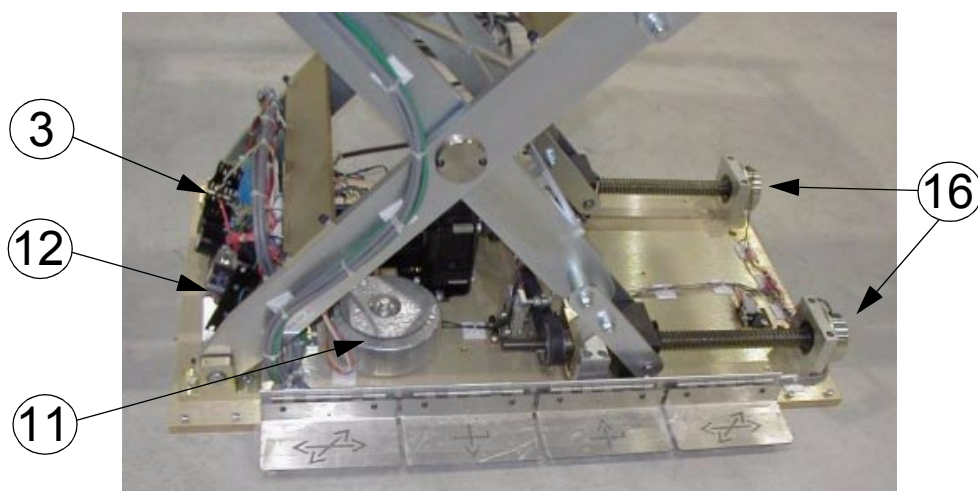


Figure 27. Replaceable Parts Location Diagram

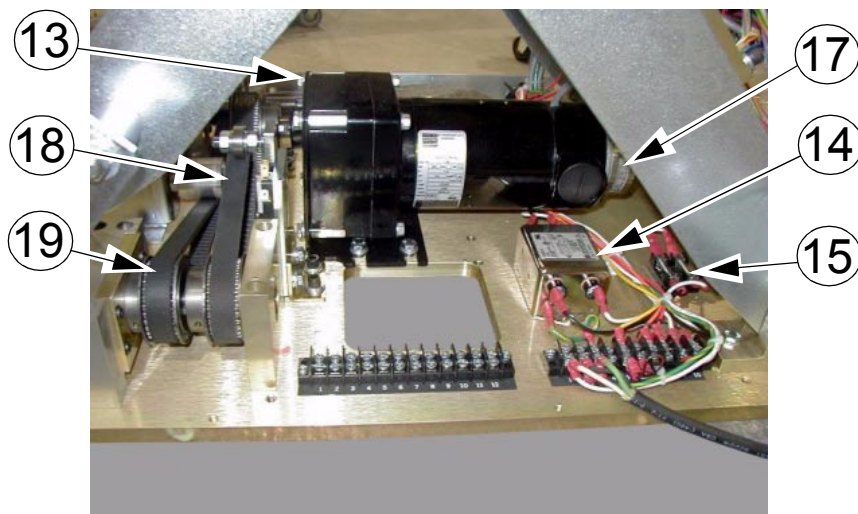


Figure 28. Replaceable Parts Location Diagram

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Chapter

5

DIAGRAMS



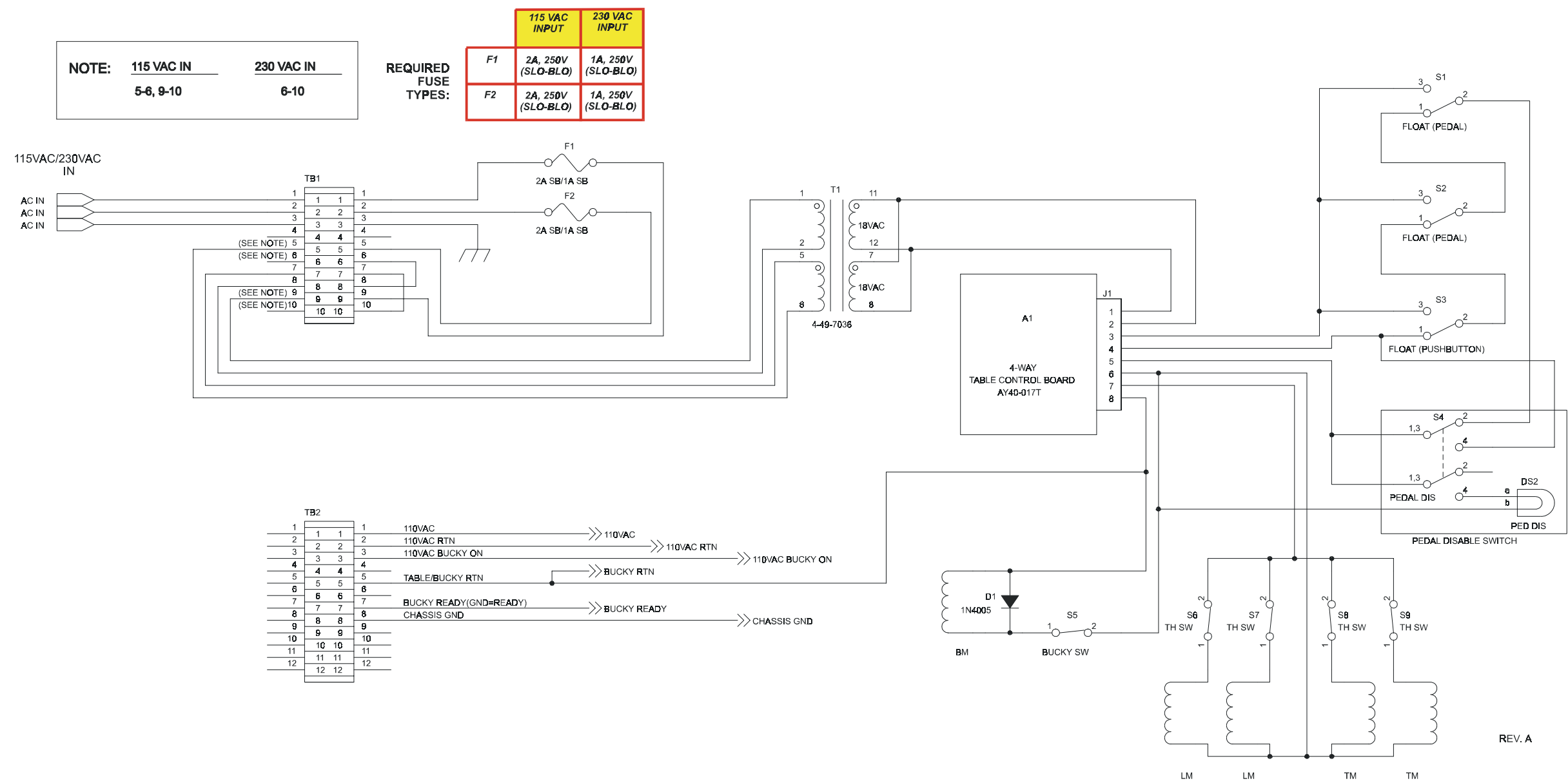


Figure 26. Model QT-740 Radiographic Table Wiring Diagram

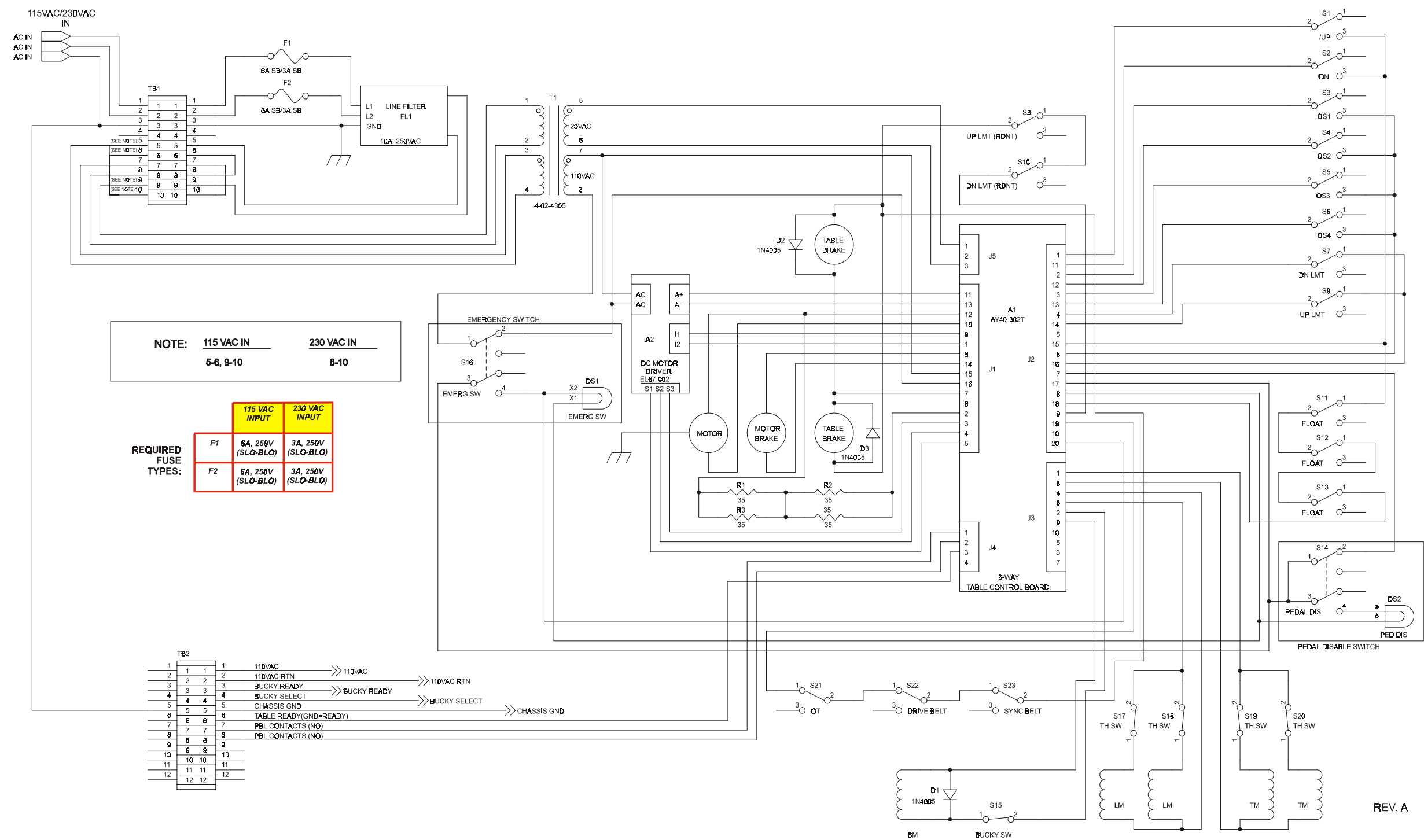


Figure 27. Model QT-750 Radiographic Table Wiring Diagram

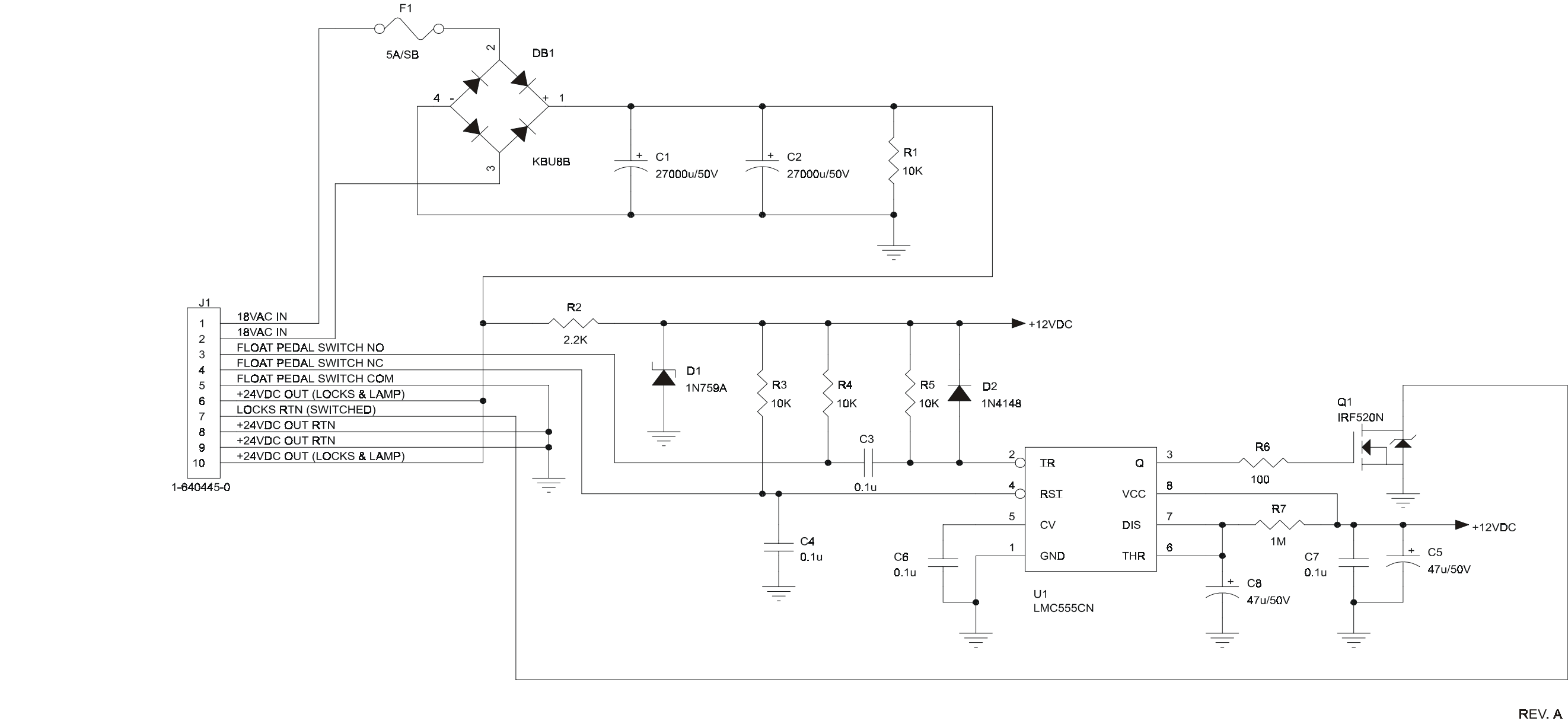


Figure 28. 4-Way Table Control Board A1 (AY40-017T)

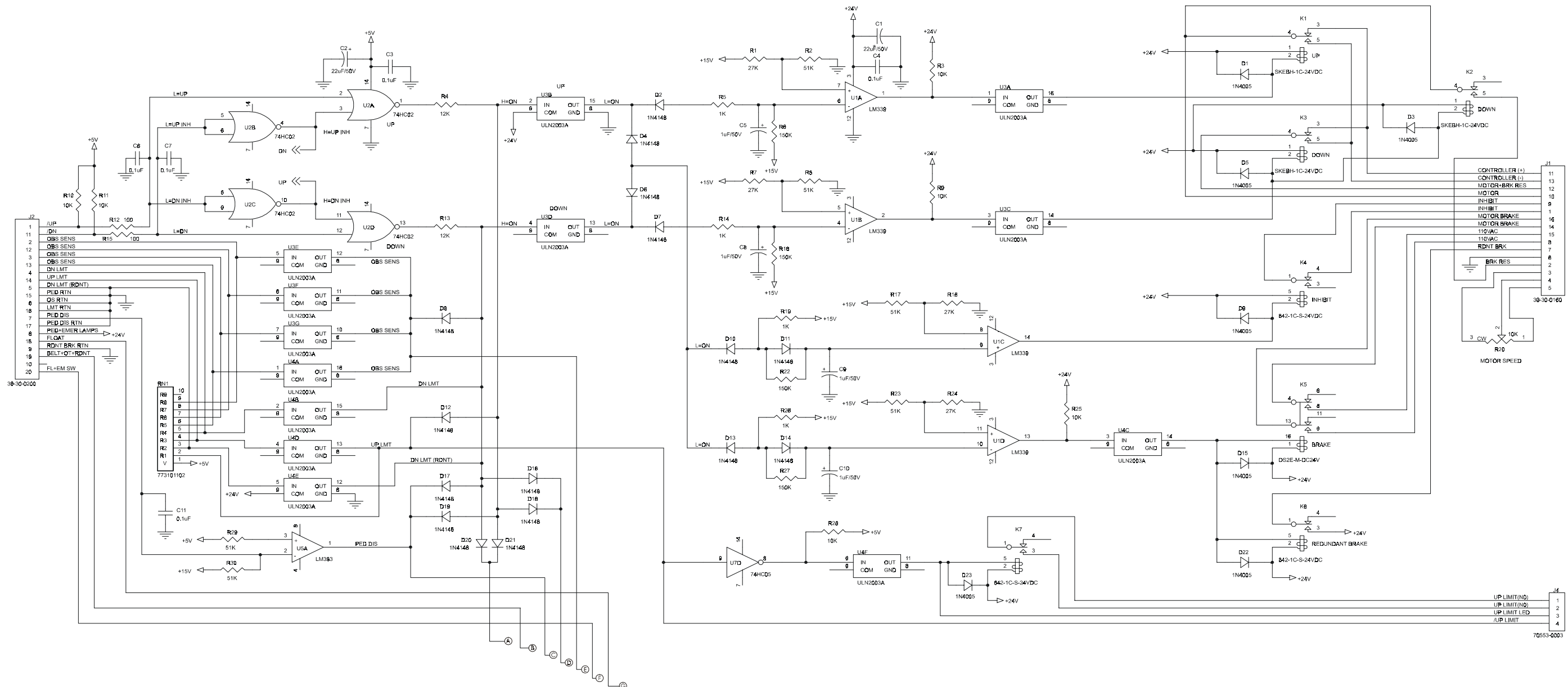


Figure 29. 6-Way Table Control Board A1 (AY40-002T (Sheet 1 of 2))

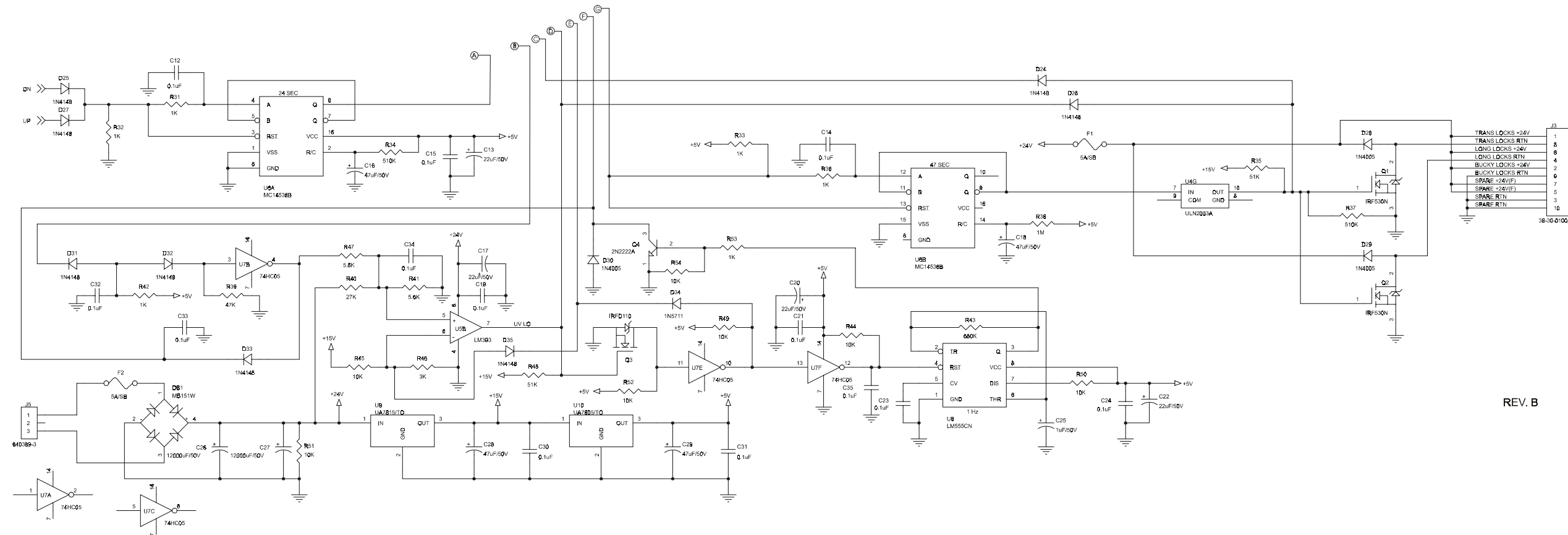


Figure 29. 6-Way Table Control Board A1 (AY40-002T (Sheet 2))